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D. K. MINOR, PROPRIETOR.] FOR APRIL, 1836. [NEW SERIES—VOL. IV.

NEW-YORK FARMER.

APRIL 1, 1836.

AGRICULTURAL BANKS.—The following communication of W. P., is worthy of attention—especially from the agricultural community. We are fully of the opinion, that the Banking System should be regulated by a general law which will allow every citizen to participate in its benefits.

Any individual, or number of individuals, who desire, should be permitted to receive money on deposit, and discount notes at such rates of interest as may be agreed on by the parties.

There should be an *established* rate of interest for all cases where the rate is not specially agreed upon, and also, for all institutions and companies having the privilege of issuing bills, or paper, to an amount exceeding their capital; and further, the private property of stockholders should be holden for the redemption of all issues.

The plan here recommended by W. P., is to us a novel one, and we should be pleased to have the opinion of others in relation to it.

For the New-York Farmer.

ON BANKING AND PAPER CURRENCY.

It is unfortunately too evident, in every debate on this subject, that "preconceived opinions usurp the place of facts, and speculations as unsubstantial as the 'baseless fabric of a vision,' are substituted for correct observation."

The opinion of the mass of our citizens, that to grant monied charters is anti-democratical, has no doubt been given very honestly; but they appear not to be sufficiently informed on the subject to know, that when a given number of charters have been granted, restriction becomes aristocratical, and extension democratical.

Before the introduction of paper currency, it was a very rare occurrence for any man to rise from a state of poverty to wealth and influence; those who were poor had ever to remain in that condition, and were considered by the wealthy as their slavish tools.

Banks, when legitimately established, may be considered as store-houses, wherein those who have more money than they can use to advantage, deposit the surplus, to be loaned to enterprising individuals, who can use it profitably. If banks were restricted to specie issues, there would be no banks established; for the rent of buildings sufficiently secure to keep safely the immense amount of specie to bank to any extent, including clerk-hire, transit of specie, &c. &c., would absorb all their profits. It is, therefore, on their paper the profits are obtained, and the government ought never to interfere, excepting so far as to secure the public against loss.

It is an extraordinary fact, that no civilized nation has ever attained its liberty permanently, unless subject to a system of paper credit; and so closely does the paper system appear to be interwoven with this sacred cause, that it may safely be asserted no nation can long retain its liberty when paper credit is destroyed. Its operation, too, is so simple, that it appears to have been overlooked by our long-sighted party politicians. A great number of individuals, whenever paper credit is established, are constantly breaking through the line between poverty and wealth, who are gradually ascending the scale of society, and carrying through nearly all stages their democratic feelings, at least until they arrive at the summit, when most of them become aristocratic. It is this class, who are constantly contending with the over-grown wealth and influence of old families, that have neutralized the aristocratical power in England, sustaining the principle of liberty, and enforcing a liberal construction of the laws. Let their paper credit be destroyed, and the nation deprived of the influence of that portion of the democracy who are rising from poverty to wealth, and those who are now wealthy would soon combine and tyrannize as much as before paper issues were established. A similar effect would ensue in any other country.

Our agriculturists are deeply interested in the monetary system, as much beyond any other class of citizens, as their annual surplus is larger. As banks are now established, they confer very little benefit on the farmer; and so far as their interest is concerned, they could do quite as well without them. It is truly surprising that the agricultural interest of America has been so generally neglected by our State legislatures, and the United States government. But it is still more singular, that our farmers should coolly look on, and see every other branch of industry seeking for monetary assistance, when as a class they have struck out no means by which they can partake of similar privileges. Capital, and facilities for raising loans, are as essential to them as to merchants, yet no system has been adopted for their benefit.

I would suggest a system for agricultural banking, which may appear crude, but will probably lead some master mind, having more talent and leisure than myself, to improve upon, and carry out to a more perfect system.

I would previously warn our farmers, if they value the existence of our democratical form of government, to put an end to our present mode of banking by specific charters; for so sure as this system is continued, so sure will our legislative bodies become so corrupt, as to be the disgrace of the age in which we live, and to the total prostration of our admirable form of government. The less a government interferes with the circulating medium of a country the better, as their interference ever produces much embarrassment in monetary matters. Banks should be permitted to go into operation under general laws, not by specific charters. This no doubt would have been effected long since, if very many of those who have the power to grant charters were not corruptively interested in the grants made.

Self-interest is so general, and so powerful a motive of action in man, that to expect to have a pure legislative body, with the means of corruption ever before them, is truly absurd. Let us then remove, as far as possible, all means of temptation; and as granting monied charters is one o the most fruitful sources of corruption, we should begin by abolishing it.

Let a general law be passed permitting property owners to establish banks predicated on real estate. The main provisions of such a law should be, that every property owner, who wishes to do so, should be permitted to deposit his deeds in the bank, and the bank have power to issue paper to the amonnt of the value of all the estates so deposited. Every property owner, after depositing his deeds, should have the privilege of discounting his own notes to an amount not exceeding a given portion of the value of his estate. The profits of the bank to be equally divided among the depositers of deeds. Provisions against fraudulent valuations, and many other regulations to keep in check the overweening selfishness of indviduals, will have to be made.

It must be obvious to our agriculturalists, that a great portion of those who buy estates, have not sufficient funds remaining to cultivate them effectively, and many thousands are kept poor for want of pecuniary assistance to put their lands in good condition. With such a system of banking they could improve their farms to any rea-

sonable extent, and repay the loans as the produce in after years should remunerate them for extra outlays.

Those who know any thing of farming, must be aware, that few farms will allow of taking up money at seven per cent., with the additional expense of mortgaging. This difficulty would be removed by such a system of banking, and as the profits would be divided among the depositers of deeds, the interest to be paid would be only the expense of the management, which need never exceed two per cent. Their paper, too, would have good credit, it being known to be based on a value ever equal to the issues.

W. P.

For the New-York Farmer.

FARMERS' WORK FOR SPRING.

Ploughing is the first great operation. On this subject, so familiar to farmers, no doubt they will disdain to be instructed. We have to say first, then, let your work be done as neatly and as evenly as possible. The appearance of this work well done, instead of the slovenly manner in which it is generally executed, besides the satisfaction which it gives the farmer himself, renders the after cultivation much more easy. As to the depth of ploughing, this must be in a great measure regulated by the depth of the soil. We believe no advantage is gained, but much injury oftentimes occasioned, by turning up a cold gravelly substratum and turning down a rich loam, out of the reach of sun and air. Our experience has satisfied us, likewise, that land fresh ploughed is much more favorable to vegetation than that which has been long turned up; and though the situation of the work may be such as not to allow of any postponement, it is desirable to sow and plant as soon after the ploughing as possible.

The second great operation is manuring. Too much manure may be given, but the usual error, is that of giving too little. We are satisfied in this matter, that the nearer manure is kept to the surface of the earth, so that it is covered or mixed with the earth, but barely to secure it from evaporation, so much the better for the crop.

Planting, especially of Indian corn, excepting in wet places, can hardly be done too early; the earlier the better; and if the ground were prepared for it, we would always put it in the last week in April, or at farthest, the first of May. Though some some of it may perish in the earth, such a contingency should be as far as possible guarded against, by using an extra quantity of seed—in this matter we are not in general half liberal enough; and also, where early planting takes place, there is in general, in case of failure, the better opportunity of repairing the deficiency. The corn early planted, may, after coming up, be cut down by an early frost; but usually it will start again, and have greatly the advantage of that which is planted late. Our own, and the experience of many of the best farmers, whom we have known, have satisfied us of the expediency of early planting.

The present season has been so backward, and so much time has been lost, that in many things the farmer must do as he can, not as he will. The cold winter and backward spring of 1780, were followed by an abundant summer; and with this experience, there is as yet nothing at present, to forbid the hope that the coming season may be as fruitful.

H. C.

This communication was received in time and should have appeared in the March number of the Farmer, but was by accident omitted. Although late, we give it now, by way of apology for delay.

Our worthy friend, "A PRACTICAL FARMER," will please accept our thanks for this letter and its contents. We have recently received many such tokens of good will.—A TEN DOLLAR note, accompanied by a valuable communication for the Farmer, from each its patrons, who appreciate its worth, would soon restore *that* department of our business to its condition before the conflagration.

For the New-York Farmer.

ROME, N. Y., Feb. 25, 1836.

MR. MINOR—SIR—I enclose ten dollars to pay arrearages, and in advance for the New-York Farmer.

As the season of the year will soon arrive for farmers to commence their operations on their farms, I should like to communicate to the public, some experiments which I have made on harrowing winter-wheat in the spring. And as I have never seen published, any thing of the kind I will state my manner of operation. As soon as the ground gets settled and dry on the surface, so that a team will not tread it up, I commence dragging my wheat with the drag I usually use in draging in grain, (the square drag,) and let it lop half, and follow immediately with a roller, to press the roots down if any are torn up. I always like to do it just before a storm, and if I want to seed my land with clover, I sow my seed previous to dragging, and have had it catch as well as when sown with spring grain.—And I think dragging has the same effect as hoeing does on corn, and have never seen any injury. I have tried it several years and find it increases the growth both of straw and head, and have seen one fourth difference by good judges at harvesting.

A PRACTICAL FARMER.

P. S. I should like to receive some information on the culture of turnips—the best kinds and the way of cultivating them.

Yours Respectfully.

☞ Will some one of our readers, who can give the desired information in relation to the culture of turnips, do us the favor to furnish us a statement for cultivation?—PROP. N. Y. FAR.

Annexed we give an account of the Lemon tree, to which we alluded in our last.

To the Editor of the New York Farmer.

OYSTER BAY, March 31st, 1836.

In compliance with your request, I give you the particulars of my Lemon tree, as accurately as my recollection will permit.

The tree was planted by Daniel Youngs Jr., deceased, in or about the year 1812. The orange from which the seed was taken was sent from South America, by Thomas Flecet: the orange stock was inoculated with lemon in the year 1830. Since then about 30 of the lemons have came to perfection.—There are four ripe ones upon it at present, and about 20 green ones of various sizes, besides blossoms. The tree itself is about eight feet high, and the body about two inches in diameter. During the summer months standing in the open air, and in winter in a warm room.

Yours, &c.

DAVID YOUNGS.

For the New-York Farmer.

THE SEASON.

We have just closed a winter of most extraordinary severity. The mercury, in some very rare instances, may, in other winters, have sunk to a lower degree—indeed, the preceding winter, on the 4th January, 1835, where we had an opportunity of making observations, the mercury in Fahrenheit stood, for an hour, at 32° below 0, while the last winter, 1836, the same thermometer, in the same situation, never descended below 18° below zero; but when the continuance, as well as the severity of the cold, is taken into view, no winter on record can be compared with the one through which we have just passed. The winter of the year 1779–80, approaches nearest to it; then the snow continued, it is believed, even later than the present winter. The year 1673 was likewise very remarkable for the intensity of the cold. The winter just finished has been remarkable for the abundance and uninterrupted continuance of the snow; in many parts of the country, on Connecticut River, for example, at Greenfield and Brattleboro', the sleighing was uninterrupted for four months and a half; and the amount of snow which fell, exceeded, by actual measurement, any remembered, during an exact record of abovet wenty years. The spell, however, is now (25th of April,) fairly broken; and if we have suffered from a Russian winter, there is every promise of a Russian spring. The ground has no where been deeply frozen, and the grass has been ready for some time to start, as soon as the covering should be taken off, and it could see daylight.

The grain, where we have seen it uncovered, looks healthy and well set. It has been generally supposed that, where the ground continued covered with snow, it has proved favorable for wheat, but not for rye. We do not profess to understand the philos

ophy of this; and experience, the only infallible teacher, seems this year in a fair way to correct this impression; neither the rye nor the wheat appearing to have suffered at all from the season.

The winter has been dreadfully severe with the cattle; many, in different places, having actually perished by starvation; and others coming out in a miserable condition. The prices which hay and grain have commanded, induced many farmers, early in the season, to sell, to their own serious injury; having, through the desire of accumulation, been led to stint their own flocks. The winter has been so much longer continued, and so much more severe, than any calculations or expectations made it, that this has proved a fatal error to many. High prices occasioned by severity, are no evidence of prosperity. It is only a speculation upon the necessities and sufferings of the community; and where farmers are obliged to buy of other farmers, who, perhaps, have been a little more provident or fortunate, it is only evidence of general distress, and not of prosperity; the community certainly become no richer by this process; and for all the animals that perish or suffer through want, they are rendered the poorer. A strictly domestic trade, and a mere interchange among each other, however high the prices may be, adds nothing to the general stock of wealth. The basis of wealth rests entirely upon production, and the improved value for sustenance, convenience or utility given to those products by skill and labor. We do not mean to say, however, that it is other than a time of general prosperity in the agricultural community. In all the great markets all the products of the earth command extravagant price. Beef, in New-York Cattle Market, from 10 to 12 dollars per hundred. Pork, cheese, butter, flour, Indian corn, rye, wheat, &c., bear most extraordinary prices. Broom-corn brush, which for years was sold as low as 2½ cents per lb., now commands 14 to 15—and the wool market affords every promise of remaining firm. The advantages, however, in this case, are not all on one side. If it is a good time to sell, it is rather a hard time to buy. All the articles of living, beyond what the farmer produces, and many of them have become the actual necessaries of life, are dear in proportion; and labor never received a more ample recompense. Various causes of a fictitious nature, have no doubt contributed to these effects, the results of which no human foresight can calculate. We refer particularly, as every one sees, to the immense extension of bank capital, and the flooding of the community with paper money, which, as long as public confidence is secure, works admirably; but which would work very perversely, if that confidence should be shaken. There is, however, one great consolation; if a currency based wholly upon credit, has extended itself to an extraordinary and perilous extreme, it has called out human labor to such an extent, and that labor has itself so much increased and improved the value of the products of the earth, has brought so much more land into cultivation, and rendered that, which has been long since subdued, so much more productive, that the actual wealth of the country, and, consequently, the means of sustaining public credit, have greatly extended, and are daily extending themselves in a most extraordinary manner. H. C.

25th April, 1836.

OHIO AGRICULTURE.

We are happy to lay before our readers the following letter from an intelligent correspondent on Western Agriculture.

For the New-York Farmer.

CHILLICOTHE, Ohio, Jan. 27th, 1836.

REV. H. COLMAN—DEAR SIR—Yours of 5th came in good season, but as there was no particular haste required, I have delayed answering until the present time.

The high prices of produce this season, will have upon the Agricultural community, a good effect to stimulate them to greater exertions, to realize more from their land than they have hitherto dared to hope for. It has raised the price of land throughout the country, and with it the ambition of land holders. Some of our farmers are so much elated with the prospect, that they confidently expect to average *one hundred and fifty* bushels of corn per acre; and one of our greatest feeders of stock told me a few days since, that he has a field of 20 acres that he should cultivate in corn; that he was confident that he would, if a good season, average two hundred bushels per acre. He intends to *drill* in the corn after the plan recommended in the 'Cultivator' some months since, (I have forgotten the page.) I was yesterday informed that a feeder a few miles below town, has sold his corn (in the shock) on the field, for *thirty-six* dollars per acre, to a Drover. The land on which it was grown could, last spring, have been purchased for twenty dollars per acre.

The average crop of wheat in this vicinity, take one season with another, is about twenty bushels, yet there has been as high as forty-five bushels to the acre in this vicinity. With the prices heretofore paid for work-hands, it has been considered that the cost of cultivating an acre of wheat, and putting in stack, was about five dollars per acre, which at the present price of wheat, ($1,) would yield the farmer about $15 nett profit per acre. There is but little rye cultivated, except for hogs, which are turned into the field before it becomes hard, and they are suffered to run upon it untill corn is hard enough to feed to them. It is generally sown early in the season, and is considered the best pasture during the fall and winter for cows and calves.

Buck-wheat and Barley there is but little attention paid to raising, as they are not considered profitable crops. From some cause (to me unaccountable,) the Potatoe does not flourish in this country. The most favorable seasons, and our best soil will not produce more than two thirds of what is considered a good crop at the East.

The root crops, such as Mangel, Wurtzel, Rutta Baga, or common Turnip is not raised for stock, although I think our soil and climate both favorable to them. The common turnip, for table use, sells from 25 cents to one dollar per bushel, in our market. The sweet-potatoe grows very well in this part of the country, yet I think they are inferior to those that I was accustomed to eat at the East. We have a very great assortment of apples, which are sold in town, in the fall of the year, at 50 cents per barrel, of the first quality. Fifteen years ago there was a great many good peaches in these parts, but they are now scarce; pears do not do well. The fire-blight seems to destroy all the trees as soon as they are of a size to bear. We have a great abundance of plums of different kinds.

You ask if the water is good? Our water is pure, though hard. It is all more or less affected with the lime-stone gravel, through which it has to pass, in coming to to the surface. Our springs are equally affected with the wells. We have but little of the fever and ague, although we are by no means clear of it; as our country grows older, we have less. Our streams are more open—waste fields are opened for cultivation, and stock to consume the vegetation, which has made a great alteration within a few years. We have more or less of the billious fever every season, but we consider it a healthy country. For my own part, I never enjoyed better health in the Eastern States, than I have here for the last six years. As it respects stock cattle, there is very little difference between the common native stock here, and with you. We have to pay a higher price for improved cattle here than with you, but there is not sufficient difference to justify the expense of a trip to the East, unless a person wanted a large number. *Good* sheep are very scarce, and consequently high, although our common sheep are to be purchased for from 75 cents, to $1 per head.

I think some of taking a tour the coming spring through Indiana and the northern part of Illinois. From what I can learn of that country, I have no doubt but that there is great openings for Agriculturalists, for those too whose means are limited.

Any inquiries you may wish to make respecting this part of the country, I shall feel a pleasure in attending to, and any service that I can render you, I shall be happy in doing. Respectfully.

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For the New-York Farmer.

SILK.

Mr. Samuel Whitmarsh, of Northampton, who went out the last autumn with a view

to inspect the silk manufactures of France and Italy, and obtain what information he could respecting the raising and management of the worms, and the preparation of the raw material, has just returned, after an entirely successful tour. We are promised some full details of the result of his inquiries at a future time. In the mean while, we lay before our readers a few incidental facts, which will be received with interest.

He says decidedly, that every thing which he has seen and learnt, favors the cultivation of silk in this country; that it may ultimately become one of the most important interests of the country; and will satisfy all reasonable expectations. As it respects climate and labor, two points in regard to which there has been much scepticism, we have a decided advantage.

As it respects labor, though wages and living are extremely low abroad, and the peasantry engaged in the raising of silk live in the most frugal and meanest manner, yet so much more is accomplished by a laborer among us than among them, that the difference in the expense finds more than an equivalent in the superior amount performed. Every thing done abroad in this way, is done in the most awkward and slovenly manner; the silk, throughout Europe, is cultivated in a small way, in cottages by humble means; and instances are not unfrequent, in which the peasantry travel five and six miles daily to obtain a supply of leaves for their worms.

The silk raised on the continent, is of a far inferior quality to that raised in this country; eight pounds of cocoons in this country, yielding a pound of silk, whereas in Europe, twelve pounds are required. This, he thinks, is to be attributed to our climate; the colder the climate, as long as feed can be found for the worms, or to speak in more classic terms, for the operatives, the better the silk. The American silk, therefore, is of a superior quality to the European or the Chinese.

Mr. Whitmarsh has brought with him several kinds of mulberry, to which he designs to give a fair trial. The white mulberry is not used, excepting as furnishing stocks for grafting. The mulberry, which he thinks is to be preferred to all others, is one known as Muries de Chine, or Chinese mulberry; but not the Morus Multicaulis. This plant is not yet introduced into France or England, but has been long enough in Italy to test its remarkable value. Its foliage, though not so large as that of the Morus Multicaulis, is yet much thicker and heavier; and it is comparatively proof against the coldest climate.

Of this mulberry he has brought a large quantity of the seed, which he warrants as genuine, and of last year's growth; and of which, he has deposited some for sale, at the store of Mr. St. John, No. 118 Broadway, at five dollars a paper, containing about 4000 seeds. Much of the Chinese mulberry Morus Multicaulis, brought to this country, is heated in ovens by the Chinese, so as to destroy its vitality; and this is the general occasion of its failure to vegetate. We shall wait with interest for further communications from Mr. Whitmarsh, on a subject so important to the agricultural community, and to the whole country; and are happy that the enterprise has been undertaken by so exact and intelligent an observer; and one, too, who has so deep a personal interest in the concern. H. C.

April, 26, 1836.

For the New-York Farmer.

PEEKSKILL, 27th April, 1836.

Dear Sir:—A method of preserving apples, in this section of the country, has been introduced to some extent, which ought to be universally known. As I have not observed that it has been noticed in any agricultural or other paper, I give it to you, that you may make such use of the information as you may deem proper. The method is as follows:—

Take an ordinary flour barrel, and as much ground plaster or gypsum as will be re required for use, of course dependent upon the quanrity of apples intended to be thus laid down. Cover the bottom of the barrel slightly with the plaster, select the best and fairest fruit, and place them singly in the bottom of the barrel, so as not to touch each other, and cover them with plaster; and so proceed in the same way, until the barrel is filled; head up the barrel and place it in any dry and proper place. The fall pippin has been preserved in this way, until the month of June. I have practised this mode of preserving apples, and find it decidedly the best that I have ever tried. There is no difficulty in thus preserving the Newtown pippin, or any other winter apple, through the summer. The apple, when taken out of the plaster, is in a very perfect state, the flavor in no way injured or affected. To the farmer, this is no additional expense, as the plaster can be used upon his land.

I should recommend this to be done immediately upon gathering the fruit; let the barrels and plaster be taken to the orchard, and laid down in this way as taken from the tree; it is the least troublesome, and the apples will be longer preserved. The reason and philosophy of this method is very apparent, as the plaster absorbs the moisture from the apples, and excludes the atmosphere from the fruit, more effectually than other substance.

Respectfully yours,

W. N.

To the Editor of the New-York Farmer and American Gardeners' Magazine.

CONSULATE U. S. A.,
CAMPECHE, 17th March, 1836.

Dear Sir:—Still detained here by unavoidable circumstances, which may probably exist 15 to 20 days longer, among other employments of my painful time, is the translation of certain portions of Volney's Journey through Egypt and Syria, augmented by notes of the Havana translator, in the Spanish edition of 1830, published in Paris. I send you now, in English, the 5th chapter, "On the Climate and Air of Egypt;" and hereafter will inform you of the application I shall make of the facts it contains.

Very respectfully,
Your ob't. serv't.,
HENRY PEMNE.

The climate of Egypt is justly considered very hot, as in July and August the thermometer of Reaumure steadily indicates 25° above the freezing point. 1 The proximity of the sun a(which in summer is almost perpendicular)is doubtless the principalcause of so much heat; but when we consider that other countries, under the same parallel of latitude, are cooler, we discover a second cause as efficacious as the first; and that is, the small elevation of the surface over the level of the sea. In respect to temperature, there ought not to be distinguished more than two seasons in Egypt, the Spring and Summer, i. e. the cool season, and the hot season. The heat continues from March to November, and even during the latter part of February, the sun at 9 A. M. is insupportable by an European.

In all this time the atmosphere is scorching, the sky scintillating, and the heat insufferable by those who are not accustomed to it. With the lightest clothing, and in complete repose, one melts into sweat, which is here so necessary that the least suppression is a disease; so that instead of the ordinary salute of "How do you do?" one should rather ask, "How do you sweat?" However, as soon as the sun departs from the zenith, the heat becomes somewhat tempered. The vapors from the grounds inundated by the Nile, and those brought by the North and the West winds, by absorbing the caloric diffused in the air, produce an agreeable coolness, and even biting cold, if we credit the natives and some European traders; but it must be recollected, that the Egyptians (who travel nearly naked, and are accustomed to sweat,) tremble at the least degree of cold. The thermometer (of Reaumur,) which, in February, maintains an elevation of 8 to 9 degrees above the freezing point, gives us exact ideas on this subject. It may be said that snow and hail are phenomena which have never been witnessed by many Egyptians of 50 years of age. With respect to the European merchants, they owe their extreme sensibility to the abuse of clothing with furs, which in winter is carried to so great a degree, that they commonly wear two or three coverings of fox skins, and which, even under the heats of June, induces them to keep on ermine.

They pretend that the coolness experienced in the shade is a more than sufficient

reason to clothe themselves with such excess—and, indeed, the currents from North and West, which almost always reign, greatly cool every spot where the rays of the sun do not fall—but the true and secret motive of this fashion is the fact that *furs* are the *lace and embroidery* of Turkey, and the favorite objects of Asian luxury. They are the signs of opulence, and the labels of dignity, since the concession of important offices is always accompanied with a fur skin—and equivalent to saying to the fortunate individual, that for the future, he is a Lord *of such rank*, that he has nothing else to do but *sweat*.

Perhaps some will judge that Egypt is very *unhealthy*, in consequence of the excessive heat, and of the marshy state of the country which lasts three months. In fact, this was the first thought which occurred to me on my arrival; and on seeing afterwards, in Cairo, the houses of the European merchants situated along the *Kalidj*, where the water lies stagnant until the following April, I persuaded myself that the *aqueous halitus* ought to cause them many diseases; bu t*experience contradicts* this presumption, *and the emanations from standing water*, so noxious in Cyprus and Alexandrietta, *do not produce any harm in Egypt*.

To me, the cause appears to be the continued *dryness of the atmosphere*, which is maintained by the vicinity of Africa and Arabia, where the humidity is incessantly absorbed; and by the perpetual currents of the winds, *which encounter obstacles*. b In proof of this opinion, is the fact that the *flesh of animals*, exposed to the North wind, even in summer, far from putrifying, *becomes as dry and as hard as a stone*. In the desert are found dried corpses, so light, that one man easily lifts with one hand the whole skeleton of a camel.2

Besides this great dryness of the atmosphere, its *saline qualities* are observed in all parts. The stones are corroded by natron, and in humid spots are found long chrystal ized needles, which may be mistaken for nitre. The well of the Jenuts Garden in Cairo, formed of bricks and earth, becomes covered with a crust of natron as thick as a dollar; and when the beds of the garden have been watered with water of the *Kalidj*, as soon as they become dry, white chrystals are seen shining on the earth, which could not have been brought by the water, as it gives no indication of salt to the taste nor by distillation.

This property of the air and of the earth joined with the heat, is what communicates, without doubt, to the vegetation an activity almost incredible to the inhabitants of cold climates. Whenever the plants abound in water, they develope themselves with prodigious rapidity. Whoever has been in Cairo or Rosetta, may have satisfied himself that the kind of pumpkin called *gara*, shoots nearly four inches in 24 hours.

But let us conclude with a very important observation: this fertile soil appears to be exclusive or *intolerant*. It is proved by daily observations that many exotic plants degenerate very soon. The European merchants are obliged every year to bring from Malta new seeds of cauliflowers, beets, carrots, and salsify. These horticultural vegetables, in the beginning, succeed admirably well, but if they are grown afterwards from their own seeds, they become wrinkled and diseased. The same has succeeded with prunes, pears, and peaches, which have been carried to Rosetta. The vegetation in this soil is too violent to nourish well, pulpy and spongy textures; in order to succeed it would be necessary to accustom them by degrees to the nature [of the soil] and to acclimate them by the force of great care in their cultivation. H. P.

NOTES OF VOLNEY.—1. The Astronomer Beauchamp, has often observed 37° and 38° in Bassora, and this degree of heat reigns particularly in the greatest part of the shores of Persia, Arabia, and India; 32° and 33°, blood heat, are very frequent in Georgia and Florida, in America. Hence Egypt should be collocated among the countries of medium temperature.*

2. Nevertheless, we should notice that the air is much less dry along the coast than on the more elevated lands; so that in Alexandria and Rosetta, IRON cannot be exposed 24 hours to the air without being covered with RUST.†

NOTES OF THE SPANISH TRANSLATOR.—* The temperature assigned by the Author to Egypt, is exactly the MAXIMUM of the Island of Cuba, CAETERIS PASIBUS, that is, in the shade. The mercury there rarely passes above 25°, even in the hottest months of July and August. Notwithstanding, in these same months, it constantly maintains itself from 22 to 24° at midday, without more variations than those naturally produced by the nightly absence of the sun, which causes it to descend sometimes 6°, and when least, 3°.

† This note is limited to the conjecture of the Havana man, that the saline productions noted by, are effects of the NITRIFICATION caused by the nitrogen of the atmosphere; but he does not suggest why or how the nitrogen becomes converted into nitric acid.

NOTES OF H. P.—a The PROXIMITY OF THE SUN cannot be the principle cause of the greater heat of summer, if our astronomers tell the truth in saying, that the earth is nearer to the sun in winter; nor can it be the cause of the greater heat of any season, or of any latitude, since, in all parts of the world, and in every day of the year, the nearer the sun that travellers have been on mountains, and æronauts in balloons, the colder have they found the atmosphere.

b The difference in the humidity of climate produced by the absence or presence of obstacles in the course of the winds, is remarkably contrasted by the extreme dryness of the air over the whole great peninsula of Yucatan, and the extreme humidity of the air in the adjoining small State of Tabasco. The North and North-West winds sweep over the level surface of Yucatan, from the Mexican Gulf to the Bay of Honduras, without encountering any elevated obstacle in their flight, and hence the rainy season, as it is called, endures but four months, and will not average more than a shower of an hour to every second or third day. On the contrary, the same winds, which pass over Tabasco, are stopped at its South and South-East boundary by the Chiapian mountains, (a N. E. spur of the great Mexican Cordelleras,) and hence are obliged to precipitate their moisture to so great a degree, that it is a common saying here, that in Tabasco it rains eight months, and showers the rest of the year.

c The Havana man adds, that "the analogies between the physical state of Egypt and of Cuba, or of the W. I. Islands in general, are so notable, that I cannot do less than indicate them at every step. The soil of Cuba does not easily admit foreign plants, although perhaps it does not reach the point of exclusion of Egypt. In fact, as the land of that Island is more varied, there are places in which it does not cost so much to acclimate the exotics of colder countries. I have eaten very good peaches produced in ground not seven leagues distant from Havana. Nevertheless, with respect to garden vegetables, they degenerate as much as in Egypt, but with this difference, that the new seeds, instead of producing wrinkled and infirm plants, vegetate with excessive violence, throw out immense leaves, and do not give time sufficient to season the nutricious juices—a circumstance which renders them extremely watery."

From the Cultivator.

KINDERHOOK, Dec. 18th, 1835.

DEAR SIR—In compliance with your request, I send you the annexed statement of the products of my farm, and their sales, for the year 1835. This is simply the account of the marketable products. I have reserved enough of the several kinds for the consumption of my family the ensuing season which are not included in this statement. My farm consists of 173 acres, of which 145 are under cultivation; the remainder is in wood. The soil is sand and fine gravel, sand and loam, and sand and clay. Portions are well adapted for grain, and again other portions for pasture and hay. I have not lived on the farm sufficiently long, fully to understand and elicit its capacities, as for a number of years I have cultivated high and rocky land, where the farmer's principal profit was made from the products of the dairy. My oats were a full crop, so were my potatoes; but first the wire worm or something else, and next, the early frosts lessened my corn crop, I think, one half; and one of my pieces of wheat was somewhat injured by the grain worm. The cultivation of my farm was done almost exclusively by myself and sons. The expenses for my family and farm, that is, money paid out, is $383.75, and this amount must be deducted from the gross sum stated as the income for the year. I will not pretend that I have raised more from the same quantity of land, perhaps not as much as many of my neighbors; if I did, their evidences of thrift and good farming would not bear me out in any such pretension.

Poducts and sales of the farm for 1835.

12 Calves,	$37	89
196 lbs Butter, at 20 cts.	39	20
1542 lbs Cheese, at 8 cts.,	123	36
30 Lambs, at 15*s*,	56	25
850 bushels of Oats, at 52 cts.,	442	00
375 bushels of Potatoes, at 2*s*,	93	75
20 tons of Hay, at $15 per ton,	300	00
72 bushels of Onions, at 4*s*,	36	00
500 bushels of Corn, at 6*s* 9*d*,	421	88
220 bushels of Wheat, 12*s*,	330	00
4 Cows Beef,	69	00
2 Oxen and 2 Steers,	130	00
7 Shoats,	17	00
1440 lbs Pork, at 7 cts.,	100	08
22 Wethers, at $4 each,	88	00
	$2,288	13
Deduct money paid out,	303	75
	$1,901	38

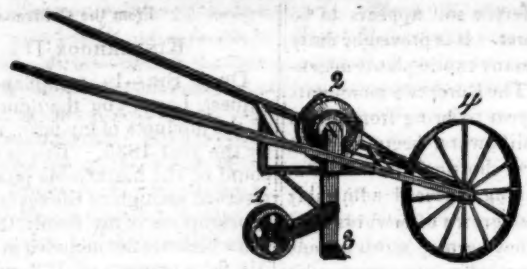
I say nothing of the labor, as we have drawn our living from the farm.

I remain your friend, &c.
SAMUEL T. VARY.

Dr. J. P. BEEKMAN.

Honey Manufactory.—A company is established in this city, with a capital of $4,000, to carry on the manufacturing of Honey. The bees may also collect honey, and in no case is it necessary to destroy them. Mr. Kelsey, the inventor and patentee, may be addressed at this place.

BEMENT'S TURNIP DRILL.



MR. MINOR,—There is scarcely any part of the extensive and important science of agriculture that has received greater improvement within these few years, than that relating to the construction of farming utensils.

Among the great variety of different implements which have been presented to the attention of the farmers, some, as may be readily conceived, have appeared, that are evidently much too expensive and complicated in their construction, for the purposes intended; and others, probably from a want of practical information in the inventor, have not been properly adapted to the uses for which they were designed; but in general they have been such as have contributed much to the present very improved state of the art.

The first drill machine was invented by a German, and presented to the Court of Spain, in 1647; but it appears, from a communication to the Board of Agriculture in Brittain, that a sort of rude drill or drill-plough has been in use in India from time immemorial.

"In the construction of all implements of this sort," says Dickinson, in his Treatise on Agriculture, "the greatest attention should be paid to have them as simple in their construction as possible, in order that they may be used without difficulty by those who have but little knowledge of the nature of such machinery; much care should also be taken to have them so made as that they may perform their work with correctness; that the seeds, of whatsoever kind, may be delivered and deposited in the ground with the greatest evenness and regularity; and that they may not be bruised or injured in any way during the application; as the want of proper attention to these particulars seems to have considerably retarded the progress of the drill system of cultivation."

The machine figured above, is simply a Turnip Drill, which is nothing more or less than a modification of the Northumberland Drill. It consists of a frame and wheel, fig. 4, with a grooved nave to receive the band, which passes round a pully on the end of the tin cylinder, fig. 2, barrel-shaped, the centre pierced with holes for the seed to escape into a funnel which conducts them o the drill, fig. 3, which forms the rut, and deposits the seed. Fig. 1, is a cast-iron roller which follows, covers and presses the earth to the seed. In using, the laborer pushes it before him, sows and covers one row at a time. From three to four acres in a light soil, placing the rows thirty inches apart, may be put in per day if required. It is very simple in its construction, very light and not liable to get out of repair, and can be used by a boy or any person who can walk on a straight line.

They are manufactured by the subscriber, and sold by him at 82 State-street, and Wm. Thorburn's Seed Store, Market-st., Albany, price $8.

☞ Orders may also be left at 94 Broad street, or at Huxley & Co.'s, 102 Barclay street, New-York.

CALEB N. BEMENT.

Albany, April, 1836.

From the Maine Farmer.

NECESSITY THE MOTHER OF IMPROVEMENT.

MR. HOLMES—Last year hay was very scarce with us, and I was under the necessity of making the best of every thing I had that would make fodder. I put my cattle about the middle of January on straw, and after a few days they ate it well, (for they will eat straw before they will starve if you take them from ever so good hay,) and when my straw was gone, they were in as good plight as when I begun. This year, I took a similar course, and have just finished my straw, and my cattle have actually improved on it; and my straw is faithfully thrashed.

I am convinced that if our cattle are well tended and kept wholly on straw, well salted, till warm weather begins, (except cows that calve early,) they will come out in good plight in the spring.

Now, Mr. Editor, would it not be good policy to plough up our old mowing—grow more grain from the sod and clover lay, and keep our stock a part of the winter on straw and avoid going to Canada to mill, (as I am informed some have done this winter.)

A POOR CHILD OF NECESSITY.

Sangerville, March 12, 1836.

For the New-York Farmer.

LOWELL, MASSACHUSETTS.

No. I.

BY HENRY COLMAN.

A recent visit to Lowell, Mass., has affected me with much surprise, and afforded a high gratification. Agriculture and Manufactures have often been denominated, and without any poetical fiction, twin sisters; their interests are so intimately interwoven with each other; in their operations, relations and success, they are so immediately dependent on each other, that I trust it will not be deemed foreign from the proper objects of the New-York Farmer, if I give some little account of this extraordinary place. Extraordinary it may well be called, for here is a city at its maturity at the age of twelve years; here is a spot which seemed almost doomed to perpetual sterility, teeming with wealth; and in that short space, the residence of a few straggling farmers, gathering, by severe toil, a scanty subsistence for themselves and their cattle, from an uncongenial and pernicious soil, is transformed into a busy and buzzing hive, with a population approximating twenty thousand, active with the impetuous spirit of industry, stimulated by rapid returns of profit, taxing to its utmost speed all the powers of mechanical genius, and labor-saving art; and with a thirst for knowledge and improvement, which seems to gather quickness from sympathy with the movements of the machinery around them, erecting halls, labratories, libraries, and cabinets, for the cultivation of science; and thus laying a broad foundation for intellectual improvement.

The moral spectacle here presented is in itself beautiful and sublime. The machinery of one of these great mills is not an unapt picture of society. Here are wheels within wheels; bands circling within bands; threads crossing threads; numerous and almost infinitely varied operations going on at the same time; much that is seen, and much that is unseen; mighty and concealed powers working in their subterraneous abodes with a tremendous agency, and sending out their influences to places far remote from their presence; human ingenuity strained to its utmost power, and human care equally concerned in the constant superintendence of this complicated apparatus; the powers of the physical world called into efficient action, moulded, guided, and brightened under the sharpened activity of intellect; the moral every where intermingling in order to preserve harmony and secure the fidelity of the intellectual and physical powers; and all, in all its parts and operations, all resting upon an unseen agency, whose activity is every where detected, but whose power is utterly unmeasured, and the mode of whose operations the brightest philosophy has not even conceived; all resolvable into one simple and great law, the law which pervades the whole material creation; holds fast the dust of the balance, the atom floating in the sunbeam, and the mightiest orb which brightens in the firmament; all, where each part retains its place, performs its duty, and supplies its contribution, moving on in a beautiful harmony; producing results largely subservient to human comfort, improvement and pleasure. On the other hand, all these results are defeated, when even the most minute and humblest part of the machinery fail to perform their proper office; determine

to go wrong, or refuse to go at all; when the wheels cease to revolve, or the filaments become broken; or the combination of physical, intellectual, and moral energy, felt in a thousand hands, beaming from a thousand eyes, and operating in a thousand hearts, is broken up, withdrawn, relaxed, or perverted. Now, this is a striking analogy of human society; this is a world in miniature. Laws bearing a strong resemblance to each other, prevail in both. They are universal laws; they are uncontrolable, and unalterable to human power or pleasure; they are ceaseless in their operation; and, like the great Being who established them, they are 'without variableness or even the shadow of change.'

Lowell is principally devoted to the manufacture of cotton; but it embraces several other important factories; very extensive woolen factories, for flannel, broadcloth, kerseymere, worsted and carpeting; extensive machine shops for the construction of various kinds of machinery, from that necessary to the furnishing of a cotton mill, to railroad cars and steam engines; together with a card and whip factory, planing machine, reed machine, grist and saw mills, glass works, iron furnace and powder mills, and extensive bleacheries and print works; in all, employing a population of nearly eight thousand operatives, to say nothing of the persons subsidiary to their support and accommodation, and a capital of nearly nine millions of dollars.

The mills in general are of a large size; generally of brick, and seven or eight stories in height, well lighted, ventilated, and warmed. The machinery seemed of the most improved and perfect kind; and in general, and as far as the nature of the occupation admitted, the neatness and order of the mills which I visited, most exemplary. The hours of work, exclusive of meals, average about twelve; and as far as I could learn, it was the determination of the overseers never to employ children under twelve or thirteen years of age; and none such were employed, except where parents, as in the block printing, where they work by the piece, chose to avail themselves of their children's aid in some of the subordinate operations. These cases were almost universally those of foreigners. They were discountenanced by the superintendents; and in my opinion, where there are schools to which such children might be sent, it ought to be made a penal offence by the statute; or in any event never more than three hours' labor in the twenty-four should be exacted from them.

The cotton fabrics made here are of various qualities; the finest averaging about 42 or 45 hanks to the pound. The printing establishments, by means of engraved copper cylinders, where sometimes four impressions are given by a single revolution of the machine, are well worth visiting; and the machinery for engraving these cylinders by the sinking of steel dies is very curious, and capable of being graduated to the thirty-six thousandth part of an inch. This is almost literally splitting a hair. The invention and delineation of the figures, displayed great ingenuity and skill. The shearing of the woolen fabrics is a delicate and beautiful operation; but the singeing of the fine furze or nap of the cotton cloth by dragging the piece of cloth directly over, and in contact with, a red hot iron cylinder without burning the cloth itself, strikes an unaccustomed eye with extreme astonishment. The card and whip factories are exceedingly curious, and as automatic machines, approach nearer to the actual operations of intellect and intelligence, than any one, who had never seen them, could imagine to be possible. Both these machines, we understand, were of domestic invention. The rapidity of the operations in almost every department of manufacture which I visited, was a remarkable circumstance. A large whip was completely braided with cord in about five minutes; and the superintendent of one of the establishments informed me that he turned out one piece of cotton cloth of thirty yards in about every minute and a half while his works were in full operation.

The standard of health among the operatives in the factories, as I learnt from the best medical sources, was considered as good. Many persons, on going into a new place, and into new and different employment from that to which they have been accustomed, generally suffer at first, and pass through a kind of acclimation; but afterwards they enjoy as good health, and in some cases the health has been improved, as before entering the mills. It is obvious, however, that some of the processes must be less favorable to health than others; as there are, doubtless, predisposing causes to disease in some, which do not exist in other temperaments or constitutions.

Of the moral character of the present manufacturing population of Lowell, I feel authorized to speak in high terms. I was permitted to look, in some cases, at the books, in which the names of the individuals employed are recorded; and if they are discharged, the causes of that discharge are mentioned. The instances of discharge for improprieties of conduct were comparatively very few. The regulations for enforcing decorum and order are strict; and the character of the present superintendents of these establishments, such as to afford an ample guarantee that all which can be done shall be done to secure the good conduct and virtue, and to promote the comfort of the young persons under their employ. These gentlemen, acting with such powerful influence as they necessarily exert, it is obvious, hold a highly responsible situation. The virtue and welfare of many thousands of very susceptible beings rest upon what they do or what they fail to do: and as long as they rate the value of moral character so highly, and insist upon moral correctness, as indispensable to their patronage, and encourage sentiments of high self-respect among the operatives themselves, they certainly will do much towards securing the moral purity, and advancing the moral improvement, of these interesting communities. It was delightful on Sunday morning, at the first sound of the bell, to see the multitudes of well-dressed young people crowding into the Sunday School, and into the house of God; and it was a circumstance of peculiar gratification to learn, that more than three hundred of these young persons were communicants at one of the churches in that town. The congregating of such vast numbers of young people, removed in general from the restraints of home, presents, it cannot be denied, great perils to virtue. The manufacturing districts of old countries have long been stigmatized as places of most flagrant licentiousness and immorality.—The character of our population is essentially different from that of the places referred to. Our manufacturing population have in general had the advantages of careful domestic training, and a good school education. They are not manufacturers for life; but design to remain only long enough in the mills to get the means of a settlement in life. They have undoubtedly, the greater part of them in New-England, been blessed with a religious education; and they are looking forward to rise in life, and feel the high worth and indispensable importance of character every where among us. These circumstances cannot fail to operate most favorably among them; and their beneficial effects are instantly to be seen. Whether they will remain sufficient will be matter of just concern with every benevolent mind.

Much is done, likewise, for their intellectual improvement. Frequent and most valuable courses of scientific lectures are given,—to which access is made easy by the payment of a very small fee. A social library and reading room are established, likewise, on the most liberal principles; and a chemical laboratory, and a splendid mineralogical cabinet have been procured. We have never been in a community where the spirit of inquiry seemed more active, or found more patronage and encouragement.

Add to all this, that great instrument of virtue, of comfort, and of the amelioration of the condition of the poorer and laboring classes, the savings' bank, is in full operation among them; and here, as in every case where it has been tried, has produced the most salutary effects; the deposits already amount to $200,000, and promise to be greatly extended—a great proportion of the depositors being found among the young women engaged in the establishments. The perfect security of the wages of labor, is among the most efficacious protections of human virtue; and a powerful encourager of industry, frugality, and temperance—virtues so important to individual character and comfort, and to the general welfare of society.

I shall subjoin to this a statistical account of the Lowell manufactures, showing, in extensive detail, the condition of these establishments on the 1st of January of the present year,—a document well worth examination.

H. C.

March, 1836.

STATISTICS OF LOWELL MANUFACTURES, JANUARY 1, 1836, COMPILED FROM AUTHENTIC SOURCES.

Corporations,	Locks and Canals.	Merrimack	Hamilton.	Appleton.	Lowell.	Suffolk.	Tremont.	Lawrence.	Middlesex.	Boott Cotton Mills.	Total
Capital Stock,	600,000	1,500,000	900,000	500,000	500,000	450,000	500,000	1,200,000	500,000	1,000,000	7,650,000
Number of Mills,	1	Print Wks, &c. 5	Print Wks, &c. 3	2	Cotton and Carpet Mill in one building.	2	2	5, another for bleachery preparing.	2, and Dye House.	4 Two going into operation, and two to be erected the ensuing season.	27, exclusive of Print Works, &c.
Spindles,		95,701	19,456	11,776	5,000 Cotton besides Woollen.	10,752	11,520	31,000	4,620		129,998
Looms,		1,253	560	330	142 Cotton. 70 Carpet.	348	404	910	38 B'cloth, 92 Casim'e.		4197
Females employed,		1,321	780	470	325	460	460	1250	350		5416
Males employed,	300	437	200	65	150	70	70	200	185		1377
Yards made per per week,		184,000	85,000	100,000	2,500 Carp. 150 Rugs. 55,000	90,0000	125,800	200,000	6300 Cas'e, 1500 Broadcloth.		849,300
Bales Cotton used in do.		120	75	95	76	86	90	180	None.		732
Pounds Cotton wro't in do.		44,000	28,000	33,000	30,000	30,000	34,000	64,000	600,000 lbs. Wool, p.an. 23,000,000 Tassels.		263,000
Yards dyed and printed do.		165,000	70,000	None.	None.	None.	None.	None. Printing Cloths	Sheetings and Shirtings, No. 14 to 30, 34 to 41 in. wide.	Broade'ths and Cassimeres.	233,000
Kinds of Goods made,	Machinery, Cars and Engines for Railroads.	Prints and Sheetings, No. 22 to 40	Prints and Drillings, No. 14 to 40	Sheetings and Shirtings, No. 14	Carpets, Rugs, and Negro Cloth.	Drillings, No. 14.	Sheetings and Shirtings, No. 14.				
Tons Anthracite Coal expended, p. an.		5,200	2,000	300	180	294	329	650	500		9453
Cords of Wood per annum,		1,500	15,00		500	70	60	60	1000		4690
Gallons of Oil, "		8,700	6,000	3,375	Olive 3000, Sp'm. 4500.	3,840	3,692	8217	Olive 11000 Sp'm. 2500.		54,824
Diameter of Water Wheels,	13	30	13	13	13	13	13	17	17 & 12	17	
Length of do. for each mill,	14	24	42	42	60	42	42	60	46 & 21	60	
Incorporated,	1792	1822	1825	1828	1828	1830	1830	1830	1830	1835	
Commenced operations,	1812	1823	1925	1828	1828	1832	1832	1833–4	1830	1836	
How warmed.	Hot Air.	Hot Air Furnace.	Hot Air Furnace.	Hot Air Furnace.	Hot Air Furnace.	Hot Air Furnace.	Hot Air Furnace.	Steam.	Wakefield Furnace & Steam.		

LOWELL, MASSACHUSETTS.

No. II.

By HENRY COLMAN.

It is exceedingly curious and interesting to observe how closely associated are all the interests of society, interlocking each other in every direction, like a thickly woven web, of the most complicated texture, and united by a common, reciprocal, and indissoluble dependence. How much it were to be desired that men could better understand this; and see that the just prosperity of one branch of business is in a degree the prosperity of all; that there can in fact be no long and permanent monopoly of the great advantages of social life; that success and prosperity in any particular department of business have a tendency to diffuse themselves like the great elements of nature; and that the gains of any one man in the various connexions, fluctuations, and ever varying relations of society, become ultimately the gains of all.

There have been times, when men, under the influence of mistaken views, possibly, in some cases, under the influence of corrupt motives, have endeavored to excite animosities and prejudices among the commercial, manufacturing, and agricultural classes and interests. Now nothing could be more wrong in respect to each of them; and though government may sometimes adopt a partial policy, an unjust system of favoritism, granting peculiar privileges to some, to the prejudice or exclusion of other interests, yet it must be admitted as a great and incontrovertible principle, extending itself through every department of society, through all its multiplied ramifications, that the welfare of one part is the welfare of all; the prosperity enjoyed by any one portion, necessarily reflects its light upon the rest; and that any long continued and exclusive appropriation of any of the great advantages of life is no more possible than a continued and exclusive appropriation of light, or air, or water.

The mutual and reciprocal benefits to be derived from Agriculture by Manufactures, and from Manufactures by Agriculture, may be illustrated by a recurrence to some of the statistical details of some of the Lowell Manufactures, as published in a tabular sheet on the 1st of January, 1836. We shall recur to them by way of illustration, premising only that our remarks must be brief; and that we are without the means of illustrating the truths with which we set out, so fully in detail, as we otherwise might have done.

The Manufactures at Lowell then, have collected a population of nearly twenty thousand in a spot where formerly there were not twenty individuals, all of whom are more or less concerned in, and all of them to a great degree entirely dependent on, the success of these Manufactures for employment, subsistence, and comfort. They are withdrawn from other pursuits, many of them from Agricultural labor, and they are to be supported by the products of Agriculture; for bread and meat must come from the earth. Being withdrawn from Agricultural labor, they render that labor more valuable; and congregating in this way, they

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☞ For the following article we are indebted to a lady, who will accept of our thanks in our own behalf, and on account of the public, who will be benefitted by the discovery which she has been so good as to communicate.—[New-England Farmer.]

TO GET RID OF RED ANTS.—Take green or dry sage leaves, scatter them plentifully round the place infested, and allow them to remain during one season, and these troublesome insects will certainly disappear. Several who have made the experiment have found it successful.

During the months of December and January last, the average number of persons who passed from Brussels to Malines, by the Railroad, was never under 800 every day. The total number of passengers in December was more than 28,000, in January more than 29,000; this will probably be surpassed in the present month.

The Augsburg Gazette states that it has received tidings up to the 3d of March from Patras, which contradict the rumors of an insurrection in Greece. Four hundred Klopths in order to escape from the Turkish troops had flung themselves on the Greek territory. But the garrison of Missolonghi instantly took up arms and repelled the marauders with loss.

consume more of the products of labor, than if they were scattered in the families to which they belonged. Besides this, they have introduced a large amount of foreign population, by whose extraordinary skill and labor we are greatly benefitted and vast public improvements are effected; and whose subsistence of course creates a new demand and market for the products of Agriculture. These effects are strongly perceptible in the immediate vicinity of Lowell; and a ready and high market is found there for all kinds of Agricultural products. This is certainly great gain to the farming interest; and valuable, not solely from the immediate profits, which it now yields, but from the inducement and stimulus, which it gives to improvements; and to a more extended and productive cultivation. There is another mode in which the cause of Agriculture here is indirectly but greatly benefitted. Much of the wages received by the laborers in these factories is remitted to friends at home; perhaps to extingush mortgages or incumbrances on the family estate, or to aid in improving the domicil.

Separate from the products of Agriculculture consumed in the subsistence of the operatives of those establishments, let us look at some of the items of those articles which are used immediately in the process of the manufacture. Of cotton, 13,676,600 lbs. Of wool, 1,600,000lbs. Of wood 4690 cords. Of starch, 510,000 lbs. Of flour, forstarch in the mills, printworks and bleaching, per annum, 3,800 barrels. Of charcoal, per annum, 500,000 bushels. Of Teasels, 3000,000. These amounts are certainly enormous; and when added to the bread, meat, vegetables, hay, oats, corn, milk, fruit, &c., &c., necessary for the consumption of the human machinery here employed, it is easy to see what demands are made upon agriculture for the supply of them; and what quick and profitable returns the supply of them brings back to the farmer.

The power of machinery is another circumstance that strikes one with astonishment on visiting these places. Operations which it would require years to accomplish by any other process, are here accomplished in a day. Operations which the combined power of a thousand men, could not effect, are here performed under the superintendence of a child. Operations which human power, singly applied, could never effect, are here daily and hourly effected by the simple revolution of a wheel or the pressure of a lever; and all this, with an exactness and precision absolutely perfect, I may properly add, sublime. Of the increased value given by manufactures to the raw material, and of the perfection to which the art is carried, I may be allowed to quote an example from Dr. Ure, in his treatise on the cotton manufacture. Such, he says, is the exquisite nature of the machinery in Manchester, England, that a pound of cotton is capable of being spun into 350 hanks; in which case, the yarn produced by it would extend 294,000 yards, or 167 miles; and that which, in a raw state, cost 3s 8d, sterling, (this remember, after paying the planter, the merchant, the freighter, &c., &c., an ample profit,) after being thus manufactured, would be worth twenty-five guineas.

The prejudices existing against machinery are fast losing their hold upon all reflecting minds; and its advantages upon *their* condition are becoming far better understood by the common laborers. Whatever tends to abridge the severity of human toil, and to abate the necessity of such an expenditure of human power, as is both wearing to the spirits, and destructive to human life, must be a general benefit. Whatever multiplies to an almost universal diffusion, not only the comforts,but even the harmless luxuries of life,whatever leave men more time to apply to the high purposes of intellectual improvement, or to innocent social enjoyment, must be a blessing. If the man who causes two blades of grass to grow where but one grew before, is to be pronounced a public benefactor, certainly he is not less so, who will cause four to grow with no greater expense of labor than the production of 1 blade formerly cost. Threshing machines have been, in some cases, the victims of popular resentment and frenzy; but there would have been equal reason in tearing down every blacksmith's shop in the kingdom,and breaking to pieces every plough and spade; for the plough and spade are equally machines; and as great advances upon the earliest instruments of tillage, as the threshing machine over the common flail. If the threshing machine debars some persons from their accustomed business, it relieves them from their accustomed toil; if it makes their labor less valuable, it renders their bread less dear; if it closes one source of income and subsistence, it leaves them time, strength, and opportunity to make choice of others. If the stick or the shell, or the improved machine, the spade, must be brought back to take the place of that admirable contrivance for saving human labor, the plough, then must nine tenths of the land, now in tillage and productive, be thrown out of cultivation; the means of human subsistence be in proportion diminished, and the price of what is produced enhanced. In *time*, as we have already remarked, an immense deal is gained; that is now accomplished in a single day, which formerly, years of patient and severe toil could not have completed. I know that cupidity and avarice may still lay claim to all this time, which machinery saves; bnt this does not necessarily follow; for wages are not reduced; and though the means of subsistence are increased the power of procuring it is proportionally extended; and unless men choose voluntarily to surrender their time, they can save much for rational enjoyment and improvement. I know, too, that there are those, who are disposed to tax human strength to its utmost limits under the pretence that men would abuse their liberty if they had more leisure. Many, undoubtly, would abuse it; but this is not a necessary consequence of such a relaxation; and while libraries, public lectures, books of general and useful knowledge, are so much multiplied, and means of improving, and innocent amusement are also multiplied, the danger of such abuses is daily lessened.

Let us remark in the next place, how, by means of improved machinery, the comforts and innocent luxuries of life are diffused. I am disposed to call elegance of dress, for example, when it is such only as befits our circumstances and means of expenditure, an innocent luxury. We have certainly high authority for regarding it with favor; for what is more beatiful, gay, splendid, variegated, brilliant and gorgeous than the flowers of the field; the scales of the reptile; the shells of the crustareous tribes; or the plumage of the birds? Now, how are these innocent luxuries multiplied and placed within the reach of all the industrious classes of the community; so that the most humble dwellings are often decorated with an elegance of furniture, which not many years since, the wealth of palaces could not have purchased; and the dress worn by many of the laborers in these establishments, and paid for too, by their honest industry, before it is worn, is such, as in times not far gone by, princesses of the realm would have envied. A pair of silk stockings, presented by the French Ambassador, to Queen Elizabeth, was a rare possession, to be brought out only on extraordinary occasions; and deemed a magnificent present. A taste for dress I know will be condemned by many ascetic and severe moralists. Pride of dress is, indeed, always contemptible; and can only be excused through want of understanding. But a strict care of the person, and a particular care of the dress, alike in respect to its neatness, propriety, and elegance, will be found not a mean auxiliary to purity of sentiment, decorum of manners,and innocence of conduct. Vulgarity and slovenliness of dress, and utter disregard of personal appearance, especially in the young, is too often but an index to grosser neglects, and the harbinger of moral delinquencies. Every thing on the other hand, which contributes to promote self-respect, increases a sense of the value of character; and a high sense of the value of character is one of the greatest securities of virtuous conduct.

There is another good,resulting from the modern improvements in machinery, which is not immediately obvious at first sight; but which is certain, and deserving great consideration. Much has been said of the division of labor; and the perfection to which by means of it, the arts have been carried. This has been illustrated by a reference to the manufacture of a pin, which passes through various processes, each requiring or employing a different artizan. The same things occur in various other manufactures. The effect has heretofore been that one person has been confined for life to a single, minute operation; and that, most probably, an uninteresting one; and requiring in order to its expert practice a long and tedious apprenticeship. Such is, in many cases, the improved character of the machine employed in various operations, that the machinery itself, with a self-directing and self-adjusting power, performs many operations at one and the same time; and with a precision which the human hand or eye can scarcely be expected to attain and preserve. This is particularly illustrated in the whip and card manufacturing; and this is a great gain to humanity and

a general benefit; since many operations, which were very trying to the health and spirits, which required long practice and intense application, are now performed by machinery under the superintendence of a child, after, it may be, a week's, or a month's instruction. H. C.

March, 1836.

From the New-England Farmer.

FARMERS' WORK.—CULTURE OF POTATOES.

From some experiments which were made by J. Whitlaw, Esq., and given in detail in the New-England Farmer, vol. i. p. 53, and vol. iv. p. 314, these two important facts were made apparent; 1st, Large potatoes are better for seed than small ones; 2d, It is best to cut off the butt and top end from each potatoe, and cut the middle pieces into quarters before planting.

Mr. Knight, the famous English horticulturist, has found, that for a late crop small *sets* [seed potatoes] may be used; because the plants of the late varieties always acquire considerable age before they begin to generate *tubers* [new potatoes]; but for an early crop, he recommends the largest seed potatoes; and he has found that these not only afford very strong plants, but also such as readily recover when injured by frost, for, being fed by a copious reservoir beneath the soil, a re-production of vigorous stems and foliage soon takes place, when those first produced are destroyed by frost or other cause. He adds—"When the planter is anxious to obtain a crop within the least possible time, he will find the position in which the tubers are placed to vegetate, by no means a point of indifference; for these being shoots or branches, which have grown thick instead of elongating, retain the disposition of branches to propel the sap to their leading buds or points most distant from the stems of the plants of which they once formed parts. If the tubers be placed with their leading buds upwards, a few very strong and very early shoots will be produced; and not only the earliness but the quality of the produce in size will be much affected."—[Hort. Trans. vol. iv. p. 448.]

M'Mahon advises to cut seed potatoes "a week before planting, in order that the wounds should have time to form a dry crust; for, if planted immediately after being cut, they imbibe too much moisture, many of them rot, and the rest are greatly weakened thereby." Some advise to wet seed potatoes, and roll them in pulverized plaster of Paris, immediately before planting.

Dr. Cooper, in the last Philadelphia edition of Willich's Domestic Encyclopedia, observes—"The best method [with regard to seed potatoes] appears to be this: choose your potatoes for planting of a moderate size, rather large than small, for there is no good reason to be assigned for breeding from diminutive parents; cut your potatoes into sets, two eyes to a set; throw away, without hesitation, into the hog-trough, all the diminutive and inferior eyes, choosing your sets from the middle of the potatoe; do not cut the potatoe down the middle."

Dr. Deane observed, that if dung be used in raising potatoes, it may be spread before the last ploughing, or else laid under the sets. The latter method will give the largests crop. Dung laid under the sets will produce more than if laid above them, as Mr. Wynn Baker proved by actual experiments. The feeding roots should go into the manure, not directly into the hungry earth below; and therefore need some loose earth to extend themselves into.

Mr. Loudon observes, "the best manure for the potatoe appears to be littery farm yard dung, and the best mode of applying it, immediately under the potatoe sets. Any manure, however, may be applied, and no plant will bear a larger dose of it, or thrive on coarser or less prepared manure; even dry straw rushes, or spray [decay leaves] of trees may be used with success."

The worm and grub attack potatoes. Loudon observes, that the only remedies against these destroyers are change of seed and soil. It has been said, however, that sifting quicklime or unslacked ashes over the hills soon after planting, will preserve against these insects. Care must, however, be taken not to apply either of these substances to the sets or roots when planted, lest they corrode them. It is recommended to scatter a handful of plaster of Paris over each hill, immediately after the first and second hoeing.

INDIAN CORN.

The proper soils for this kind of grain, are the sandy, sandy loam, gravelly loam, and rich red, or dark colored earths, which have but little clay in them. A clover sod, well turned over, after having been well covered with long manure, makes the best preparation for this crop. It will be of service to go over the ground with a roller, and harrow lengthwise of the furrow, just before planting. All seeds flourish best when put into fresh stirred mould. The time of planting should vary according to the season and part of the country. Dr. Deane observed that the right time of planting may be from the first to the third week in May; or a little sooner or later, according to the dryness of the soil, and the forwardness of the spring. The farmers have a rule in this case, said to be borrowed from the Indians, which is, to plant corn when the leaves of the white oak begin to appear. But if much time is likely to be consumed in planting, it will be necessary to begin in the driest part of the field a little earlier than this rule directs. Judge Buel observed, "My rule has been to plant when the apple is bursting its blossom buds, which has generally been between the 12th and 20th of May."

Shell the seed gently by hand that it may not be torn or bruised; and if any corns appear with black eyes, let them be rejected. The preparation of seed for planting, has been different by different cultivators; we will give several modes of preparing seed-corn, and the tiller will take his choice. Judge Buel observed, "The enemies to be combated are the wire worm, brown grub, birds and squirrels. Of these, the first and two last prey upon the kernels, and against these, tar offers a complete protection. I soak my seed twelve to twenty hours in *hot* water, in which is dissolved a few ounces of crude saltpetre, and then add (say to eight quarts of seed) half a pint of tar, previously warmed, and diluted with a quart of warm water. The mass is well stirred, the corn taken out, and as much plaster added as will adhere to the grain. This impregnates, and partially coats the seed with tar. The experience of years will warrant me in confidently recommending this as a protection for the seed."

A writer for *Goodsell's Genesee Farmer*, with the signature of W. T. W., recommends wetting seed corn with soft soap, and rolling it in plaster, and gives the details of an experiment which tested the utility of the practice.

A solution of copperas in water has been recommended as forming a good preparation for seed corn. Mr. J. Ellsworth, of Connecticut, in a communication published in the N. E. Farmer, vol. x, p. 331, stated as follows:—"Last year I soaked our seed corn in very strong copperas water, as near as I can recollect from twenty-four to thirty-six hours; every kernel was made as black as charaoal; the man who planted the corn called me a fool, and said it would never vegetate. But every hill planted came up well, and during its growth excited the remarks of all who saw it, as being the most even field of corn they ever saw. Not one hill in the whole seven acres was injured by worms; and we had often in previous years been compelled to replant several times, when it had been cut down by the worms. We had over sixty bushels to the acre."

With regard to the sort of corn to be planted, there is much to choose. The Hon. Samuel Lathrop, in an article published in the N. E. Farmer, vol. xiii., p. 185, states, that he had procured a sort of corn of Judge Buel, which was about a fortnight earlier than that commonly used, which, he observes, "I think will prove a valuable species to those who wish to sow their land with wheat. In ordinary seasons, it will have become sufficiently ripe for harvest by the middle of September. It is a species of the twelve-rowed corn, but the growth of the stalk is very small, compared with the twelve-rowed corn which I have been accustomed to plant—not exceeding one half the weight, of course the exhaustion required to sustain an equal number of stalks is much less. This species of corn will bear planting much thicker than any other kind of field corn which I have ever cultivated. I this year [1834] planted the hills three feet apart in both directions, intending to have three stalks in each hill. But it may be planted three feet by two and a half, and then the ground will not be more shaded than it is with the corn generally raised here, when planted in squares of three and a half feet. The ears set low on the stalk, grow of a good size, and the grain is heavy. I think it is as valuable for use as any other kind of this

grain; and from the fact that it will bear planting so thick, I believe that I can secure a larger product than from any other that I have ever tried. But the circumstance that gives it its chief excellence in my estimation, arises from the fact that I can gather my corn in season for the sowing of wheat. In the most unfavorable season, the wheat may be sown in September, and in very favorable seasons, early in that month.

Capt. Coffin, of Newburyport, in the N. E. Farmer, vol. xiii., p. 282, gives an account of the culture of an early sort of corn, received from the Hon. O. Fiske, of Worcester. Capt. Coffin observed, that "Early in May, the corn arrived at hand. On the 14th same month, I had about half a peck of it, after being soaked two or three days in a saturated solution of copperas, planted on less than half an acre of inverted sward, broken up for the purpose. It was manured in the holes, was hoed twice with very little hilling in either operation. It was in spindle and ear the first of July, fit for boiling about the 15th to the 20th of the same month, and was harvested the middle of September; and immediately husked out, measuring forty-five bushels in the ear, being more than ninety bushels to the acre. The stalk is very small and ran seldom higher than four to five feet. The ear is small and not long, but the kernel is set very compactly on the cob; is good for boiling green, excellent in bread, and very useful to the farmer on account of its early arrival at maturity; and would have been much more productive had it been planted two and a half by three feet distant, instead of three and a half by four, and some even more distant.

"I also made an experiment the last year with another kind, (the spindle corn presented me by a friend,) which has a small but exceedingly long cob, running from nine to over fifteen inches in length, is eight-rowed, of a fine bright yellow color, very productive and excellent for bread, and was harvested ripe before the frost of last season [1834], and the last season it is well known was not one of the most favorable seasons for the growth of that article."

One of the most important improvements in the culture of corn consists in planting from four to six times the usual quantity of seed; and, at the first hoeing, pulling up all but the proper number of plants, leaving to form the crop none but the most healthy. The additional quantity of seed will cost but little, and the labor of pulling up all but three or four of the strongest plants, is much more than repaid by the increased product. The seed should be covered with clear mould, and not too deep.

A handful of unleached ashes, or a mixture of about equal parts of ashes and plaster put on each hill, immediately after planting, will be useful, not only to nourish and stimulate the young plants, but as a preservative against the cut worm.

An excellent article on the culture of Indian corn, by Capt. Chandler, was published in the N. E. Farmer, vol. xiii., page 291. This should be read with care by every cultivator before he commences the raising of his corn crop.—[New-England Farmer.]

The way to preserve your Indian corn against the wire worm and against birds, is to dissolve about a pound and a half of copperas in warm water, enough to steep about three pecks of corn, or in other words, make the solution as strong as it can be made, put in as much copperas as the water will dissolve, and soak your corn therein 48 hours before you plant it. The corn will thus be secured against the *wire worm*, which destroys the kernel, while in the ground, but not against the *cut worm*, which eats off the young shoots, just below the surface of the soil. The remedy against the cut worm is the application of quicklime, or unleached ashes, or a mixture of both, on the hill, soon after planting. Potash, dissolved in water, in the proportion of about one pound of potash to two quarts of water, is said to make an excellent wash for fruit trees, destroying the bark louse, and some say the borer.

Cleanse your Cellars.—If you consider good health an object worth your attention, you will be careful not to breathe the gases which emanate from putrefaction, either those which are caused by the decomposition of vegetable or of animal substances. Rotting or rotten potatoes, cabbages, turnips, and other vegetables, as well as beef brine, pork brine, and tainted meats of any sort, are often unsuspected causes of bilious or typhus fevers, and should, therefore, be removed in season to the compost bed, and covered with earth, or otherwise disposed of, so that they may not annoy the senses, nor poison the air, in and about a farmer's premises. We have been assured by physicians of eminence, that they have reason for believing, that bilious or typhus fevers, of a malignant or fatal kind, have often originated from sources of this description.

Sea Sand as Manure for Potatoes, &c.—A letter from William Moody to the Hon. Josiah Quincy, published in the 4th volume of the Mass. Agr. Repository, p. 353, recommends sea sand as an antidote against the wire worm, and has no doubt it would prove efficacious against other insects which infest potatoes while growing. This writer says,—"I am persuaded, from experience, that sea sand, put under corn or potatoes with manure, or spread on the land, will go far, if not wholly, to the total destruction of those destructive worms on which nothing else seems to have any effect. It has a beneficial effect, spread on land before ploughing, or even after land is planted with corn or potatoes; not only to destroy the wire worm and other insects, but to increase the crop. With my neighbors, a load of sea sand is considered preferable to a load of their best manure, to mix in with common barn manure, or to spread on their gardens or low flat land."

Mr. Moody likewise says, in the same letter, "late planted potatoes, which are gathered in before ripe, are far the best for seed the next year. If kept in a dry warm place in a cellar, they will be much earlier, and likely to produce more abundantly the next year, and will be as good for use the following spring, though they may not be so good in the fall."

Mr. Moody's opinion relative to planting late or unripe potatoes, is corroborated by an article originally published in Loudon's Gardener's Magazine, and republished in the N. E. Farmer, vol. v., p. 409, in which it is stated, that "the ripe potatoe, having performed all its operations, becomes more inert; but the circulation of the sap in the unripe tuber having been stopped, it starts more readily, and with greater vigor when planted: the one seems to die, worn out with age, the other seems accidentally to have fallen asleep, and when awoke, possesses an unspent vigor and energy."

From the Genesee Farmer.

LETTERS FROM A FATHER, LIVING IN THE STATE OF NEW-YORK, TO HIS SON IN WESTERN PENNSYLVANIA, ON THE COMPARATIVE PROFITS OF COWS AND SHEEP.

The suggestions contained in these letters relative to the fitness of your farm for the stock husbandry rather than for grain, will probably lead you to reflect on the expediency and manner of altering, in some respects your system of farming. If you come to a decision, that the husbandry of live stock should become the principal object of your farming, then important questions will arise in your mind, and tease you for satisfactory solutions. Among the questions which it may be supposed will agitate your mind are the following, If the stock husbandry is to become your principal object, then what sort of stock is it likely will best subserve your interest? Of the three principal sorts of stock, consisting of cattle, horses and sheep, which offers to you the greatest inducements to become interested in it? I have, chiefly with a view to your interest, taken no inconsiderable pains to ascertain the profits which the animals composing these several kinds of stocks, particularly cows and sheep are capable of producing, and to compare them, with a view to know which sort of stock can be kept to the greatest advantage. The task has not been an easy one, nor can I suppose that I have made myself by any means master of the subject.

I have not entered much into the estimate of horses. That raising colts is not, under ordinary circumstances, the most profitable branch of stock husbandry, has long since been my settled opinion. That opinion has not been altered by any investigations of the subject, which I have been making. On a small scale, and in connection with only one or two good breeding mares which can be made, by their labor, to pay their own expenses, raising colts may be a tolerable business. But to keep breeding mares for little or no other use than to breed, can be no other than a losing concern. The expenses incident to raising horses under these circumstances, will far overbalance the profits. Such certainly will be the results, unless the object should be, to raise the very first rate of horses; and in order to do this, an amount of capital will be required, which ordinary farmers cannot conveniently, and certainly better not, spare for that use. My opinion is, that in your case other sorts of stock can be raised, and kept on your farm, to better advantage than horses.

Cattle and sheep are, in my opinion, the animals on which you ought principally to rely for stocking your farm. You now have in your possession some of both, and some of each sort you will always find it necessary and profitable to keep. But if it be contemplated to extend your stock husbandry, it will be advisable to know which of the two sorts is capable of being rendered the most profitable. In order to ascertain the profits of any sort of stock, two things are obviously necessary—the one, to know the expenses incident to keeping

the animals—the other, the value of their produce. According to this plan of investigation, I proceed to ascertain first the annual expenses incident to keeping a cow. From my own observations, and other lights on the subject which I have been able to obtain, I judge that, on an average, it will require 1½ tons of hay, or its equivalent in other keeping, to winter a cow. This will rarely be estimated at less than $12. To keep her through the summer will require about 2½ acres of good pasture. This will be estimated differently, according to different valuations of land, but I will say, it is equal to $7. The interest on the capital vested in the cow, may be $1,50. According to this estimate, which I am satisfied does not vary far from the truth, the annual expenses incident to keeping a cow are equal to $20,50. Is it generally understood that it costs about as much to keep a cow one year as she is worth? Such appears to be the fact, and yet she is a very profitable animal. It is believed none is more so. The value of her produce is next to be estimated.

A good cow, (and when I say *good*, I mean no other than an ordinary cow of the native breed,) may, under proper management, be expected to produce annually at least 200 pounds of butter. This will be yielding at the rate of about 4½ pounds a week for 10 months, during which time it is supposed the cow will give milk. The butter then, at 12½ cents, the lowest price, will be worth $25. The skimmed milk, which may be given to the calf, or to hogs, may be worth $3. The dung which the cow will be the means of making, may be worth $1. According to this estimate, the annual produce of the cow will be equal to $29, and the balance standing to her credit, after paying the expenses of keeping her, will be $8,50. Nothing is here estimated for the expenses incident to taking care of the cow and making the butter. Be these what they may, it is clear that a handsome profit will remain after all charges are paid. Butter making is probably the most profitable use to which dairy cows can be applied, especially when the scale of business is small, and only a few cows are kept. But when cheese making is the object, the average produce of cows, in that article, is said to range between three and four hundred pounds annually.

In regard to sheep, I assume it as my data, that it costs about the same to keep twelve sheep through a year as one cow. It requires also about the same investment of capital to gain possession of that number of sheep, as to become the owner of a cow. It may appear to cost less to *winter* twelve sheep than one cow, because sheep are not usually fed from the barn so long as cattle by several weeks. Yet they derive their living from the farm, and are justly chargeable for what they consume. If then it costs the same to keep twelve sheep as one cow, which I am satisfied will not vary far from the truth, the expense of keeping that number of sheep through a year will, according to preceding estimates, amount to $20,50. Let us see now what will be the value of their produce.

The fleeces of twelve sheep may weigh 36 lbs. This quantity of wool, at 50 cents a pound may be worth $13. The lambs which the flock will produce, may be worth $8. The annual income then from the twelve sheep, will be $24, while the expenses incident to keeping them will be $20,50. The result is a clear profit of $3,50. From these estimates, it appears that keeping sheep is a profitable branch of husbandry, but I think it appears that keeping good dairy cows is still more profitable. In either case the husbandman receives considerable more than a full compensation for all his labor, and the use of the land which is devoted to these purposes. Under such circumstances, how can he fail of becoming a thrifty farmer?

In cases where large farms are cultivated—or where the proprietors of good grazing farms do not understand the dairy business—or have not convenience for carrying it on advantageously—or have not a taste for that branch of rural industry, it is believed sheep stock offers greater inducements to become interested in it than any other. It is unquestionably one of the most sure and profitable branches of husbandry. I have little doubt that the inhabitants of Western Pennsylvania will soon begin to understand and realize the import of this remark.

To apply the subject of this letter more particularly to your own case, and that of others whose circumstances may be similar to yours, I have still to make several remarks. It will be necessary for you to keep, as you now do, a small flock of sheep. This you need not extend much beyond what will be required to supply wool for your own domestic use. Good dairy cows will be more profitable to you than sheep. I think so, not only because cows are in my opinion, capable of yielding greater profits than sheep, but because I am satisfied that you have a taste for that branch of husbandry. I am satisfied too, that your companion has a taste for it, and is well qualified for a good dairy mistress. These things are essential. My advice to you is, to avail yourself as soon as practicable, of a few good dairy cows. If the cows now in your possession are not good, put them off and get better ones. Keep none but such as are good. Keep no other but good stock of any kind. To this last article of advice, you ought to attach great importance, for it reveals one of the principal secrets of good stock husbandry. While inferior stock is a nuisance to its owner, good stock makes him rich.

To close my remarks on the subjects of which I have now been treating, I will advert, though with reluctance, to those serious misfortunes and discouragements which you, and many others in that vicinity, have experienced in the loss of cattle. The disease which has proved so fatal, is said to be murrain, and yet the cause of it is supposed to be blood-suckers, otherwise called leeches. Whether the true cause or nature of the disease is yet known, must, I think, be considered as doubtful. If the disease is caused by blood-suckers, why has it not prevailed, and always prevailed, in all places? Blood-suckers are to be found every where.

Many years since, a similar disease, which was called murrain, prevailed here, and carried off many cattle? Subsequently nothing of it has been known among us. Be the disease what it may, or whatever may be its cause, you think you have found a remedy for it. In this I hope you will not find yourself mistaken. For the satisfaction and benefit of interested inquirers, I would gladly publish the remedy, if I could do it correctly. The article to be given as medicine to a distempered animal is, unless I have entirely forgotten, spirits of turpentine, but I do not recollect what quantity. I understood this had proved effectual in several cases, and in every case in which it had been tried.

It is not my opinion that the recent prevalence of disease among your cattle, although it proved fatal to many of them, need operate as a discouragement from making efforts to increase and improve your cattle stock. I have no doubt, that when the country becomes better improved, cattle and sheep will be as healthy there as in any part of the world. A FATHER.

New-York State, March 1836.

From the Genesee Farmer.

METHOD OF GROWING FLAX SEED ON FALLOW GROUND, WITHOUT INJURING THE WHEAT CROP.

Plough the ground as early in the spring as practicable, then drag it lengthwise. Then sow not to exceed half a bushel of flax seed to the acre, and harrow it well with a fine toothed harrow. Nothing further need be done until the seed becomes ripe—then mow it down, and when dry, it can be drawn into the barn and stamped off with horses.

The ground is then in better order for wheat than it would have been had it lain idle. The crop on rich land will be from 10 to 15 bushels to the acre.

The above statement is no visionary theory, but has been successfully practised in Seneca county some years past. My information was had from a gentleman of the first respectability, by the name of Stephen Cook, who is a practical farmer, and has cultivated the above named crop with success. He resides at Fayette, Seneca county.

If this method of cultivation should succeed, I hope some of the fraternity of farmers will contrive to save the flax that grows on the stalk, by cutting it with a cradle or some other way.

It is true, the flax will be coarse in consequence of being sown so thin, but it might answer for cordage or coarse cloth.

It may be well to add, that the oil makers at Waterloo are in the habit of furnishing seed to the farmers in the spring, and receive the same quantity after it is harvested without interest. Oil makers in other parts would probably be willing to do the same.

ABNER F. LAKEY.

Palmyra, March 19, 1836.

From the Maine Farmer.

WORMS IN THE HEAD OF SHEEP.

As is usual in severe winters, much damage has been done among the flocks of our farmers during the past season, by "worms in the head." Although this subject has received much investigation, yet there are some things not yet known respecting it. It is beyond a doubt that this worm is caused by a fly which deposits its egg, probably in the nostril, during the summer. The egg probably hatches—we say probably, for we do not know as any one has ever *seen* the operation—and then *probably* the little worm seeks its way up the nostrils into the *frontal sinus* of the head. But what is the *frontal sinus*? If you take a sheep's head and shave off all the skin and flesh from it between the eyes and above the nose, and then cut into the bone, you will find that the outer crust of bone is very thin, and that between this thin crust and main skull bone there is an irregular cavity. This is what is called the *frontal sinus*. In the sheep it is pretty extensive, considering the size of the head, and even extends up over the eyes. This sinus is divided into two parts, by a thin partition of bone running up exactly in the middle of the forehead. From each apart-

ment there is a passage which runs into, and communicates with, the nose.

Through this passage the worm must probably pass into the sinus where it lives and grows until the weather is warm in the spring, when it seeks its way out into the nostril, whence it is blown out by the sheep. It then hides itself in the earth, and lies there until it is changed by a process of nature into a fly, ready to rove abroad and continue its species by depositing its nits or eggs in the nostrils of those sheep which it can "*catch nappingly.*" This being the case, the questions arise—What is the use of them, or the design of nature in forming such insects? How can they be prevented from getting into the head of sheep? How can they be killed while there?

In regard to the use of them we can give no satisfactory answer. We know that they do exist, but why is not yet ascertained. It is *probable*, however, that they have some important part to act in the routine of nature, not known to us mortals. Human wisdom is not yet able to explain the necessity or utility of it, and must own itself baffled by a pigmy fly. In regard to the preventing its getting lodgings in the head of poor *Nanny*, we can only state that several things have been adopted with but partial success. Ploughing a furrow in the sheep pasture, into which the sheep can plunge their nostrils when the fly is buzzing about them, is a good thing. Tarring their nosirils, or putting tar with their salt, is also another good thing. But it is impossible that these modes should shield every sheep in a large flock, and accordingly more or less sheep suffer every winter with them. In regard to the remedy when they are in the head, several things have been devised, viz: putting up the nostrils snuff—putting up spirits of turpentine—and opening or trepanning the head and taking them out. When the worm is in the nostril, snuff or spirits of turpentine may be useful, but not when they are safely lodged in the sinus.

This was abundantly proved to us the other day by our Friend Paine Wingate, who is always carefully observing dame Nature. He had a sheep which fell sick and died. He opened the head, or rather the sinus, and there found sixteen worms of various sizes—all comfortably situated, and apparently fat and happy. He opened the body—all was in a healthy condition, excepting a slight inflammation on the upper part of one of the lungs—and excepting also that the blood was deficient in coloring matter—hardly tinging his hands. It appeared by his dissection of the head, that the passage up the nostril is straight until it comes to the head, and the passage up into the sinus then turns upward almost at a right angle. Hence it will be impossible to get up snuff or liquid into the sinus. The best way must therefore be to trepan. Well, how shall we do this? Strike a line across the forehead from the centre of one eye to the centre of the other. Strike a line up and down in the centre of the forehead. Then about midway between the eye and the last named line, and on the first named or cross line, cut the flesh through in the form of a cross—turn back each end, dissecting down to the bone—then with some convenient instrument cut through the bone, which is very thin, and you come into the cavity—this should be thoroughly searched by a feather, or a probe of lead, that shall bend about the crooks and windings of the same until you are sure every worm which may be there, is dislodged. Then pour in a little oil, bring back the ends of the skin, and stick them down carefully with a wax or tar plaster.

Perhaps the best instrument for this purpose would be a centre bit, half an inch in diameter, with the centre awl or point very short, and two cutting sides, instead of a lip on one side and a cutter on the other. You will thereby cut a button of bone out, without breaking away the skull.

The worms which he exhibited were of various sizes. Undoubtedly sprung from eggs laid at different times. The large ones had begun to turn brown on their backs; he put them into a tumbler and covered it with a paper. They would remain torpid and motionless when in the cold, but would wake up and crawl about when warm. They were armed with two little sharp hard black hooks, formed like a cat's claw, which they could draw into their heads or foreheads out of sight, or project out at pleasure. These they used freely when in motion, pushing them into whatever they were upon, and thus drawing themselves along. They could move up the side of the tumbler with apparent ease.

There have been various conjectures respecting the manner by which they cause the death of the sheep. It is thought that one or two will be of no material damage to the animal—but where too large a family of them are congregated together, they produce death indirectly by bringing on the rot or some other disease. Indeed in many instances it is affirmed that they do not *die*, but "merely cease breathing," so gently and easily do they go out of existence. We know not how this may be. It is well known, however, that there is an intimate connection with the several parts of the body,—that a derangement in one part of the system shows itself often in another part,—that derangement in the action of the stomach affects the head. Why may not the feasting and rioting of some twenty worms in the sinus produce trouble in the digestive organs, and thereby cause death?

It is found that in cold winters and late springs more sheep die of worms in the head than any other. The reason is probably this,—in early springs the worms leave the head sooner than when the weather is cold.

We have thrown these thoughts together to induce further inquiry on the part of farmers. There is much to be learned yet upon this subject, and it is one of no small interest to them.

From the Genesee Farmer.

THE HESSIAN FLY.

One of our new subscribers in Ohio, has expressed a wish to see a dissertation on the Hessian fly, and as it may be acceptable to other of our readers, we shall attempt to furnish briefly, the most important of the information which we possess respecting it.

This insect belongs to the order DIPTERA, which includes all those insects having only *two wings*, and to the genus *Tipula*. The number of species belonging to this genus are numerous, amounting to more than one hundred and thirty of those hitherto known and described, and as many of these resemble each, care is necessary in observations on the Hessian fly, that no mistakes are made in identifying the species.

The following description of the Hessian fly, (*Tipula vaginalis tritici* of Mitchill,) is given by Dr. Akerly, in the American Magazine and Critical Review, of August, 1817. "It is a very small black insect, not so large as the moscheto of this place, with two fine transparent wings, from the roots of which, three ribs diverge, as through the leaf of a plant. The body, when examined by a microscope, is found to be divided into four segments, with a few hairs observable on each. The legs are of a yellowish cast, and transparent; the head inflected, with a short proboscis."

This, in common with nearly all other insects, passes through four distinct stages of existence: 1, the *egg*; 2, the *larva*, or maggot; 3, the *pupa*, or dormant state; and 4, the *perfect winged insect*. In this part of the country, it passes through two generations in one season, and attacks the wheat both in the spring and in the autumn. The fly, or perfect insect, deposits its eggs in the autumn, soon after the young plants appear above ground, between the lowest part of the leaf and that part which forms the main stem or straw, and as near the root as possible. "It resembles, at first, a very small white nit, and as it grows larger becomes a sluggish and almost inanimate maggot, of a white color. In this state, the proper and most natural food is the sap or juice of that kind of green wheat which has the most delicate straw."† It remains in this situation through the whole winter, apparently in the chrysalis state, without suffering any injury from the frost or snow; and in the spring, as soon as the weather becomes warm enough, and generally about the time vegetation has fairly commenced, it is transformed into the fly. In this state it performs the functions necessary for a continuation of its species. It lays its eggs between the straw or stem and the sheath which encloses it, as before described, and dies; and a new generation succeeds.

These eggs are soon hatched by the warmth of the season; and the young insects may be discovered in the form of small white maggots, within the sheath of the straw, and just above the lower joints. They here continue to feed upon the sap and tender fibres of the plant, by which it either withers and dies, or is stunted in its growth, so that the grain does not arrive at maturity. They are changed into the pupa state before harvest, and at this season, while the wheat is yet green, their presence may be readily detected by walking through the field, and pressing the heads with the fingers; those which feel soft, and unfilled with grains, are those which have been injured by the insect, and if the stalk be examined they will be found near the lower joints, somewhat resembling a flax seed, but smaller and slenderer, and of a dark brown color. They continue in this state until after harvest, and may be found upon the stubble in the field. Early in autumn they pass into their winged state, and lay their eggs in the young plants of wheat as before described.

When the fly is about to issue from the pupa into the state of perfect insect, it disengages itself by boring a small round hole through the brown case in which it is enclosed, and through the sheath of wheat just opposite to the place where it lodged, and this hole may be easily discovered as long as the stubble remains entire.*

With regard to the time of undergoing its final transformation the first time in the season, Judge Havens observes, "The size of the maggot when full grown, and the time necessary to complete its growth, depend in a great degree upon the quantity of nourishment it may obtain from the

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* Its body is about one-ninth of an inch in length.

† Havens on the Hessian fly, in Bgric. Trans, New York, vol. 1, p. 77.

* Havens.

grain, and the number of maggots that may happen to be on one straw. This, according to the best of my observations, is somewhere between four and six weeks, which will bring the time, in which its growth will generally be completed, to the first part of June. But here the several causes of variation in the time of its being laid in the wheat, and of its completing its growth, both conspire to render this time so various, that some will be full grown, and others transformed into a chrysalis [pupa,] while others are small; and this circumstance has no doubt led many skilful observers to suppose, that there are two complete generations of the insect before harvest." The second time that the fly issues from the pupa, depends also in a great degree, on circumstances. "It generally," says Havens, "begins about the 20th or 25th of August, and continues in a greater or less degree through the whole month of September, but by far the greater part of the species are without doubt transformed into a fly, in the first part of this latter month."

By understanding the history of this insect, we are enabled to apply the means for its destruction, or for escaping its ravages. As it remains upon the stubble in the pupa state after harvest, the first means to be used, is, *to destroy the stubble soon after cutting the wheat.* This is to be done either by ploughing or burning. If by the former, the pupa is buried in the earth, and is thus prevented from changing to the fly; or if it changes, it cannot escape. Unless, therefore, the stubble be completely buried, the experiment will not succeed, consequently the deeper the ploughing the better. If by the latter, the stubble must be entirely burnt in order that the destruction may be complete, for, as the insect lies near the root, it will escape unless the fire be well applied.

But the best method of preventing the mischief occasioned by it, is to *sow so late that the wheat will not be above ground until the autumn fly has perished.* As the fly is in the state of the greatest activity early in September, the wheat which is up at that season, will be most liable to be destroyed; on the contrary, if the sowing is deferred till a month later, it will in a great measure escape. It is supposed that a single frost will destroy all the insects while in the state of the fly, and if the wheat is not up before such an occurrence, no danger whatever is to be apprehended.

In endeavoring, however, to escape one calamity, it is necessary to avoid the opposite evil. If the grain is sown too late, there will be danger, as is obvious, of its suffering from the effects of the frost of winter, or in other words, of being *winter killed.* Hence a middle course must be adopted. It may also be observed, that as there is a decided advantage in *early* sowing where wheat is not attacked by the fly, it would not be advisable where no danger of such attack is to be apprehended, as is the case in some places, to sow late in order to avoid its ravages.

The best evidence in favor of late sowing, as a means of preventing injury from the fly, is experience. Among other instances, two are related by a correspondent of this paper in Pennsylvania, (vol. 3, p. 321,) who waited till the first autumnal frost, when his grain was sowed and covered as speedily as possible. The result was, that the next harvest he had a good crop of excellent wheat, while his neighbors on each side of him, who sowed earlier, did not reap more than one-fifth of the quantity, and that injured by the fly. The other instance was this:—One half of the wheat crop was first sown, when a heavy fall of rain took place, which retarded the sowing of the rest until dry weather with frost; when it was harvested, the first sown was scarcely worth taking into the barn, while the latter proved an average crop of merchantable wheat. In these instances, the effect of frost in destroying the parent insect, is obvious.

Although the *autumn* fly is considered as the cause of the far greater part of the mischief, much injury is often committed by the *spring* fly. This is more especially the case where the wheat is sown too *late* in the fall, and is not of sufficient vigor the next season to out-grow the effects of the injury. This is an additional reason for selecting a medium period for sowing. An instance of the efficacy of this course, will be found on page 81, of the current volume of the Genesee Farmer.

In conclusion, therefore, we would recommend, as the best general rule for escaping the ravages of the Hessian fly, to sow, if the season and circumstances will admit, immediately after the first frost, on ground which has since harvest been kept clear from all vegetable growth* which might serve as a refuge for it, and never in any case to sow before the early part of October. But as additional facts brought to light by further experiments, cannot fail to be useful, we shall close this article by repeating the suggestion of Judge Havens: "Let those who may have leisure and curiosity on this subject, and who reside in different parts of the country where the insect may prevail, sow small patches of different kinds of wheat, as often as once or twice in a month, during the whole season, adjoining to some field of wheat or stubble, where the insect may be found in greatest number; and let its progress be observed on those different patches of wheat, and the result of the observations be collected and compared with each other."

*It is not probable that this insect attacks any other than culmiferous plants; it is known to attack rye and barley, and possibly it may feed upon other plants of this natural order; if so, these would furnish a habitation for it through winter, unless they were destroyed.

From the Farmer and Gardner.

MANAGEMENT OF HORSES.

The feeding of horses is a thing which for the most part is indifferently attended to in this country, and indeed the system of feeding which has been adopted, is but ill calculated to preserve these noble animals in full health and unimpaired strength and vigor of body. With many planters and farmers, nothing but corn and oats, in the whole grain, are doled out from one end of year to the other. Now, these are each highly nutritous and excellent substances, and well calculcted to sustain horses under long continued and laborious work, but then are they not both too heating to the blood, and too difficult of digestion to be given without change during the whole year?—Would it not be better, putting the saving out of the question, to reduce those grains to something like digestible substances?—Whether the horses be fed upon corn or oats in the whole grains, they necessarily void a large portion of them in precisely the same in which they are received into his stomach. This fact is too well established to be denied at this late day, and hence it follows that all portions of grains which are eaten by the horse and not digested serve but to irritate the coat of his stomach, inflame his blood, and, by necessary consequence, disease the whole system. The health of a man's family is very properly said to be dependent as much upon his cook as upon any other earthly agent, whether referable to physical or atmospheric causes. Writers upon human health invariably recommend plainness of diet, moderation of eating, exercise and general temperance, and the substances which are most earnestly commended to favor, are those which afford the most bland nutrition, and which are easiest of conversion into chyle. If these recommendations hold good with respect to human diet, we would ask, are not the same general laws of nature applicable to the horse? If man lives luxuriently, and feeds upon high seasoned and lucious food, the chances are as ten to one against him that he will get the *gout*, or some inflammatory disease; and if he feeds upon substances difficult of digestion, he is just as sure to be visited with that worse than pestilent-distemper,—the dyspepsia. Ah! but would you compare the horse to man? we think we hear some one ask; and lest our motives may be mistaken we will take the liberty of replying to the query in advance of its being solemnly put to us. We do not compare the horse to man, but we hold it as a truth which admits not contradiction,—that all ailmentary substances, to be profitable to the stomach of either man or horse, should be not only nutritous and bland, but should be eaten in that state in which it is best calculated to undergo the digestive process. Mastication does much to prepare the food of the horse for that operation; but the evidences which are afforded by the substances voided by this animal, incontestibly show that it fails most lamentably in the performance of this highly necessary work. In England where the management of stock generally, and particularly of the horse, is reduced to a matter of science, but few intelligent feeders think of giving food to that animal in an uncrushed state; nor do they confine them to grain feeding alone, and for the assigned reason, that it is too *heating*. Potatoes and Ruta Baga form a part of the feed of the studs of most English country gentlemen; by which means they keep their horses in better health; the occasional feeding with roots serving to open their bowels, cool their blood, determine the secretions to the surface, render the skin loose, and the hair silky and healthy. We have said that independently of the saving which is thus effected, the other reasons are sufficient to justify a resort to the practice, and we would ask are not the melioration with the animal to which we have just alluded, sufficient of itself, to make it an object worthy of every consideration? We think it is, and should be rejoiced to find that our suggestions were improved upon yb American horse owners, for we honestly believe that infinite good both to master and beast would inevitably result from it.

From the Maine Farmer.

WHEAT AND OAT CULTTRE.

FREND HOLMES—Although the snow is

coming down by the foot, I am not discouraged about a proper seed time, and as not much may be done out doors to-day, I will give you a statement of the *relative* product of my small grain the last season for the benefit of those who may chose to profit by it, or those whose situation or inclination may never have enabled to do it as accurately.

I intended to have given you first a description of my soil, &c.—but the sowing season is at hand, and I wish every farmer to be in possession of such facts, as to the kind of crop which is most profitable, as to enable him to cultivate with judgment.

It rarely happens that a farmer cultivates thirty acres of tillage so nearly equal as to strength, culture and dressing, as was mine the past season.

I will give at one view the increase per bushel—per acre, and the value at which each was sold.

21 bushels 25 quarts wheat on 13 acres, Produced 251½ bushels.
40 " Oats—13 acres, do 420 bushels.
12 " Oats & Peas—4 acres do 120 do
Yield—per bushel wheat—11½; per acre 19½
—Value per acre at 170 cts. 32,72
Oats, per bushel 10½—per acre 31½, at 50 cts. 15,75 }
1 ton of straw at 5,00 } 20,75
Oats and Peas per bush. 10—per acre 30 —at 67 cents 20,00 }
1 ton of straw sold at 4,00 } 24,00

Until the grain is grown, the price and preparation of seed is the only difference in the experiment. Then comes the rub. The expense to *me* of harvesting, threshing and cleansing which is at least double to either of the others—so that was the crop equally sure, I should hardly know which to chose between that crop and the other two. Still I think it will be a profitable crop if properly managed.

It will be seen above that oats and peas stand ahead of the oats $3,25 per acre —this *proportion* has held good with me for the last seven years, with a single exception.

It may be said "the past year has been remarkable for produce, and also for price of grain and fodder for cattle."

As to certainty of produce, this observation is important, because *oats alone* are more certain to yield a good increase than wheat, or oats and peas. Seasons and soils have a wonderful effect on the two latter.

As to food for stock there is almost no difference in the three kinds of grain. No good farmer should ever sell a bushel of wheat except for seed. He should always have it floured, and disposed of by the barrel or otherwise, as his convenience may dictate—the bran and canel with the cut straw will be about equal to oat straw, and the flour has hitherto paid all the wheat would bring.

In some seasons and on some soils, oats get the upper hand of the peas, and the latter, unless more are added for seed, will run out—I always sow full one third peas. Hitherto, I have sowed three bushels oats to the acre, but my straw is large, and since threshing by machinery and using straw so extensively for young stock, has been adopted, I shall sow four bushels the to acre.

Oats and peas are ground and used extensively for oxen in the lumbering business, and find a ready sale in Somerset, and other lumbering counties—where they do not, as combined, a man, with a wire seive, properly constructed, can separate 100 bushels per day.

I will make you a separate communication on wheat. Your obt. servant,

JAMES BATES.

Norridgewock, April 14, 1836.

Watervliet, Dec. 28th, 1835.

FRIEND BUEL—Noticing in the December No. of the Cultivator, some queries and answers respecting the Yellow Locust, I have concluded to place the following fact, at your disposal. About 28 years ago, I first sowed yellow locust seed for a gentleman with whom I wrought in the town of Claverack, Columbia county. Seventeen years ago I sowed the same kind of seed on the farm on which I now live. On both occasions, the seed was sown about the time of planting corn; I think best not to sow before the ground is warm. The most thrifty of those sown where I now live, were transplanted the next spring after sowing, and the rest in the course of three following years. They were planted on the east and west sides of a field, close to the fence. Some were planted two feet apart, some four and some seven. They have suffered much from the borer; where planted closest, some were entirely destroyed by the worm. Three years since, those planted on the east, being the last planted, were cut down and used for posts. They made from two to four posts a piece. Those now standing will make from three to eight posts a piece. My method of preparing the seed was the following:—Cover the seed with boiling hot ley, made by putting a few ashes into the water while heating.—Let it remain in they ley one minute, then pour the seed and ley into a cullender and instantly throw on to it a pail full of cold water. Roll in plaster, and sow in drills, not one seed in a hundred fails to germinate. In rich soils, some of them will rise three or 4 feet the first year. The three thorn locust is much slower in its growth, but wholly exempt from the depredations of the borer. I have had one tree of the three thorn growing in my garden twelve years. The ground has been ploughed every year, yet I have never seen a sprout. Can you or any of your correspondents, tell whether the timber be as valuable as the yellow locust?—There is a very thrifty growth of sprouts where the yellow locusts were cut down for posts. Yours Respectfully,

A WATERVLIET FARMER.

Note by the Conductor.—The three thorned locust is a *Gleditschia*, a genus of plants resembling the locust only in its foilage. It *does not* afford good timber, nor send up sprouts from its roots.

WHITE AND OTHER WASHES, CHEAP PAINTS, ETC.

As this is the month when the cleanly, prudent farmer should be giving his barn, stables, and other out-houses, garden, and other fences, a coat of wash of some kind; and above all, as it is the period when the frugal housewife, by the aid of a coat or two of white-wash, makes old things look new, and cleanses and purifies her kitchen, pantries, and cellars. we take pleasure in annexing the following reccipts, from which each may select such as may suit his or her taste best.—Yankee Farmer.

To make a beautiful and lasting white wash,

Take one fourth-peck of unslacked lime, pour on it a kettle of boiling water; while the lime is slaking, add half a gallon of stale chamber-lie; when the lime is perfectly slaked, dilute it with water to the proper consistence, and add to this mixture one fourth of an ounce of Prussian blue. This will give you a beautiful and lasting wash that will neither peel off, nor turn yellow, and will look nearly as well as white paint. By increasing the quntity of blue you may make a pale or dark blue, as best suits your taste; or if you prefer it, by adding yellow or red ochre, you may mpartieither of those tints to your wash.

To make a cheap paint, or white wash.

Take two quarts of skimmed milk; two ounces fresh slaked lime; five pounds of whiting. Put the lime into a stone vessel, pour upon it a sufficient quantity of milk to make a mixture resembling cream, then add the remainder of the milk. When this is done, crumble and spread the whiting on the surface of the fluid, in which it will gradually sink. It must, after all the whiting has been precipitated, be well stired or ground, as you would other paint, when it will be fit for use. By the addition of any coloring matter, you may make it suit your fancy. It should be put on with a paint brush, and when dry, a second coat should be given it. The quantity above mentioned is sufficient for twenty-seven square yards.

Incombustbile wash and stucco white.

The basis for each is lime, which must be first slaked with hot water in a small tub or piggin, and covered to keep in the steam; it then should be passed in a fluid form through a fine sieve to obtain the flour of the same. It must be put on with a painter's brush; two coats are best for outside work.

First. To make a fluid for the roof and other parts of wooden houses, to render them incombustible; and coating for brick, tile, stone-work, and rough-cast, to render them impervious to water, and give them a durable and handsome appearance.

The *proportions* in each recipe are five gallons. Slake your lime as before directed, say six quarts, into which you put one quart of clean rock salt for each gallon of water, to be dissolved by boiling, and skimmed clean; then add to the five gallons one pound of allum, half a pound of copperas, three fourths of a pound of potash, the last to be gradually added, four quarts of five sand or hard wood ashes, say hickory. You may add any coloring matter that your taste may dictate. It should be put on with a painter's brush; it will, it is said, look better than paint, and be as lasting as slate; it will stop the small leaks, prevent the moss from growing, and render the part painted with it, incombustible.

Second, To make a brilliant stucco white wash. Take clean lumps of well burnt stone lime (oyster shell lime will do as well,) slake as before directed; add one fourth pound of whiting, or burnt allum pulverized, 1 lb of sugar, 3 pints of rice flour made into a thin and very well bodied paste, 1 lb. of clean glue, dissolved by simmering over a slow fire. It is more brilliant than plaster of Paris, and will last for fifty years. It should be put on warm.

Cheap white Paint.

One pound of unslacked lime, 1 pound Spanish whiting, one gallon of sweet milk, one gallon flax seed oil, one table spoonfull of salt. Pour on the lime sufficient water to slake it, and while the lime is slaking, pour in the oil so as to cook it thin, add the whiting and salt, then pour on the milk and stir it well.

A cheap green Paint.

Take four pounds of Roman Vitriol, and pour upon it a tea-kettle full of boiling water; when the vitriol is dissolved, and two pounds of pearlash, and stir the mixture well with a stick und until the effervescenc ceases; then add a quarter of a pound of pulverized yellow arsenic, and stir the whole together. Lay it on with a paint brush, and if the wall has not been painted before, 2 or 3 coats will be necessaty. If a pea green be required, put in less, and if an apple green, more of the yellow arsenic. The cost of this paint is less than one fourth of oil color, and the beauty far superior.

EXTRAORDINARY APPLICATION OF GAS.—Mr. Richard Smith, speaking of the coal mines of Nova Scotia, before the Parliamentary Committee appointed to report upon accidents in mines, says, when he first struck the coal at the depth of about 180 feet, it was highly charged with water; the water flew out in all directions with considerable violence; it produced a kind of mineral fermentation immediately. The outburst of the coal, he states, crossed the large river which passed near the coal pit. We were not exactly aware of the precise out-crop, on account of a strong clay paste eight or ten yards thick. It is rather difficult to find the outburst of coal, when clay paste is thickly spread over a country. At the river the water boiled similarly to that of a steam engine boiler, with the same kind of rapidity: so that in putting flame to it on a calm day, it would spread over the river like what is commonly termed setting the Thames on fire; it often reminded me of the saying. It is very common for the females, the workmen's wives and daughters, to go down to the river with the washing they have to perform for their families. After digging a hole in the side of the river about ten or twelve inches deep, they would fill it with pebble stones, and then put a candle to it; by this means they had plenty of boiling water without further trouble, or the expense of fuel. It would burn for weeks, or months, unless put out. I mention this to show how highly charged the coal was with gas. What I am now going to describe may be worth a little attention. There was no extraordinary boiling of the water, or rising of the gas, before we cut the coal at the bottom of the pit, more than is usually discernible in a common pond of stagnant water, when a long stick is forced into the mud. As soon as the coal was struck at the depth of 180 feet, it appeared to throw the whole coal mine into a state of regular mineral fermentation. The gas roared as the miner struck the coal with his pick; it would often go off like the report of a pistol, and at times I have seen it burst pieces of coal off the solid wall, so that it could not be a very lightly charged mine under such circumstances. The noise which the gas and water made in issuing from the coal, was like a hundred thousand snakes hissing at each other.

The science of Meteorology has arrived to such perfection that we are told that Mr. Espy, a gentleman of much learning and science of this city, predicted on Friday evening last, that there would be an Aurora Borealis between the hours of ten and eleven o'clock of that evening. The appearance of that beautiful phenomenon verified his prediction.

From the British Farmer's Magazine.

ON THE UTILITY OF CHEMISTRY TO AGRICULTURE AND HORTICULTURE.

By MR. TOWERS, author of the "Domestic Gardener's Manual," C. M. H. S.

I do not affect to apologise for the introduction of this subject at some length, into your pages, because I conceive that, however it may have occupied the attention of practical farmers, upon the urgent recommendation of men and science, it has been misunderstood, and, therefore, unjustly agitated.

I have been induced to resume the consideration, by the perusal of those admirable papers in your two last numbers, entitled *Essay on Calcareous Manures*—by Mr. Ruffin—papers which, I think, contain the soundest truths, and, therefore, may be rendered more practically available than most of the elaborate works that have preceded them. The propositions of the writer require, however, to be impartially examined; but before I attempt to do so, I shall cite a passage from a chemical work, written by that worthy and zealous man, the late Mr. Samuel Parkes, whereby the reader may, at one view, appreciate the object of the chemist, and the weight of the arguments he employs, when he urges the necessity to call his science in aid of the agriculturist.

"Chemistry" (it is observed) "will teach him" (an opulent land-owner) "how to improve the *cultivated* parts of his estate; and by transporting and transposing the different soils, he will soon learn some method by which each of his fields may be rendered more productive.

"The analysis of soils will be followed by that of the waters which rise upon, or flow through them; by which means he will discover those proper for irrigation, a practice, the value of which is sufficiently known to every good agriculturist.

"Should he himself occupy the farm, and become cultivator of his own estate, he must, of necessity, be a chemist, before he can make the most of his land, or put it in a high state of cultivation, at the smallest possible expense. It will be his concern, not only to analyze the soils on the different parts of his farm, but the peat, the marl, the lime, and the other manures, must be subjected to experiment, before he can avail himself of the advantages which they possess or before he can be certain of producing any particular effect by their means. The necessity of analysis to the farmer is evident from a knowledge of the circumstance, that some kind of lime" (*magnesian limestone*) "is really injurious, and would render land which had been hitherto very productive, actually steril."—(Chemical Essays, vol. i. pp. 8, 9,)—Again:

"A knowledge of the first principles of chemistry will teach him when to use lime *hot* from the kiln, and when *slacked*; how to promote the putrefactive process in his composts, and at what period to check it, so as to prevent the furtillizing particles becoming effete, and of little value.

"It will teach him the difference in the properties of marl, lime, peat, wood ashes, alkaline salt, soap waste, sea water, &c., and, consequently, which to prefer in all varieties of soil. A knowledge of the chemical properties of bodies will thus give a new character to the agriculturist, and render his employment rational and respectable."—(Idem., pp. 10, 11.) And in a note—

"Lavoisier cultivated 240 acres of land in La Vendee, on chemical principles, in order to set a good example to the farmers; and his mode of culture was attended with so much success, that he obtained a third more of crop than was procured by the usual method, and in nine years his annual produce was doubled.—[From Lalande's Life of Lavoisier.]

Thus far the pretensions of the chemist are made out; his objects are defined, and it must be admitted that with the exception of one or two points, which, not to be hypercritical, we may safely pass by, science has laid no claim that she cannot establish. Chemists *can* analyze soils, *can* determine the quality and quantity of their component parts, *can* detect acids if such exist, and point out antagonist principles by which they may be rendered neutral, and, to a certain extent, innoxious: thus far, then, the chemist and his science must be useful to the agriculturist; nothing but the most dense prejudice can oppose this admission; and were every farmer to become an analytic chemist, to the extent above referred to, and be able to detect the components of his soils and manures, his mind would be enlarged, his sources of rational pleasure and amusements increased, and his practice removed further from that of the empiric, in proportion as it became based upon philosophic truth.

In a former paper (No. xxxiv., p. 537,) I have endeavored to elucidate the science and operations of analysis: I now find a powerful coadjutor in Mr. Ruffin; and am satisfied that, his remarks and observations under that head of his essay, entitled "*Results of the chemical examination of various soils*," and the process therein described, are some of the most luminous which I have ever met with. The prespicuity of his description clearly demonstrates that he was familiar with his subject, and the young agricultural chemist may safely follow his steps, and rely upon the general accuracy of his deductions.

Having thus upheld the cause of chemistry I must advert to those points wherein I consider it has less claim to confidence, and these may be shortly exhibited, so as not to burden the subject unnecessarily.

The operations of chemistry have a legitimate object when they are performed upon what is considered dead or inert matter; thus, there is no material substance throughout the range of created things, which, provided it be not endowed with the *vital principle*, may not justly be submitted to the test of chemical agents. It is now admitted

by our best philosophers, that chemical action is entirely dependent upon, and identical with, electrical energy; that, in fact, the combination of all substances, and their decomposition, are maintained and effected by electrical affinities. As electricity, is the most influential of the great natural agents; being an immediate emanation (I use this word for want of a better term,) from the source of light, the sun, whose rays have been poured upon the world from the commencement of time; and as chemical action is but a manifestation of electric energy, it follows, that every individual thing which can be dissolved, decomposed, or in any way disturbed, so as to cause a change in the arrangement of its constituents, is imbued with the essence of light. Chemistry, therefore—to say the least of it—is one of the grandest and most comprehensive sciences which the human mind can employ in its researches after truth.

But the vital principle, though it may be, and probaby is, connected with electrical action, is not a legitimate subject of chemical experiment; and those chemists have erred who have attempted to discover its nature by chemical ageny. *That which destroys life*, or interferes with the vital functions, can neither tend to elucidate the nature of the one, nor discover the causes of the other. The principle of life, whether it be that of animals or of vegetables, appears to be directly antagonist to chemical energy; no one, therefore, can be justified in attempting to interpret any of the phenomena of vegetable life, by the application of chemical principles. Chemists, then, it appears to me, have weakened their own cause by endeavoring to prove too much: we know nothing of life, we consequently cannot interpret its phenomena, or refer them to those agencies which are called into action by its extinction.

Scientific men have also laid themselves open to reproof, or even reproach, by their speculative reasonings upon the practical operations of the farmer. In the laboratory the chemist moves in his own appropriate sphere; there he can, and ought to investigate the substances which nature has rendered the matrix of her vegetable productions; and thence, he may diffuse, in every direction, a knowledge of the facts which his genius and experimental acumen have enabled him to elicit; but he has no right to criticise the practice of the agriculturist in respect to the management of his crops. Abstract reasoning, from deductions drawn from the most refined experiments upon dead matter, can never authorize any interference with the well grounded practice of the cultivator—of an organized being endowed with the mysterious principle of life. Even in that modern and comprehensive doctrine of the *radical exudation by plants*, which bears directly upon the *rotation of crops*, and interprets its philosophy, the experiments which have detected exuded matters by the test of re-agents, ought to be regarded with suspicious caution, inasmuch as they have, one and all, been performed upon plants placed in unnatural situations, and acted upon by some medium altogether different from that of the soil, in which alone they could flourish, and perfectly develope their foliage and fruit.

It is the duty of the chemist to lay down clear and definite rules, by which soils and manures may be correctly analysed; and if, with an intimate knowledge of practical and theoretic science, he can combine a knowledge also of farming, attained by actual experience—as was in fact exemplified in the person by the renowned Lavoisier, and now by the writings of Mr. Ruffin—he is pre-eminently qualified to instruct, and to recommend his principles by the force of example. But in ordinary cases, men of the highest attainments in experimental science cannot command time, or the means to become extensive cultivators: hence it would always be wise to point out those facts which cannot be controverted, and to let the practical man avail himself of the aids thus furnished, in any way which his good sense may direct. If the farmer be so unconcerned or prejudiced, as to overlook or reject those important instruments of research which are offered to his notice, the blame must rest with himself. Farming is, at the present moment, in a state that demands all the resources which science can furnish. The prices of every product of the farm are reduced to a very alarming extent: but the reduction though great, bears no comparison with that of almost all the preparations of the manufacturing chemist. Yet the extension of his science has enabled him to bear up with a bold front against a depreciation of two, three, perhaps four hundred per cent.; and now to produce, with a remunerating profit, chemicals of a quality far superior to those which his predecessors sold at an enormously high price. Farmers, therefore, while they feel and admit the necessity to adopt every economical measure to insure increased produce, ought to regard the chemist and his art with reverential deference. Even the simple perusal—by a man of discernment—of the "*Electrical Researches*" of the amiable and accomplished Faraday, is amply sufficient to prove, beyond a doubt, the scientific chemist to be a person of superior order; one to whom the revealment of the wonder-woking secrets of nature is intrusted; and his art, the grandest, the most sublime treasure that could be conferred on any created being. That science, legitimately directed, is well qualified to assist the farmer, and promote his welfare, for it bears directly upon the agents which he employs in the culture of every one of his crops.

One other objection to the general utility of chemistry to agriculture remains to be noticed before I pass to the investigation of Mr. Ruffin's propositions, namely:—it is asserted and freely admitted, that the nature of soils lies open to the investigations of the chemist; but it may too frequently occur, that although experiment can readily detect the components of a soil, point out an antidote for any deleterious substance which may be traced therein, and show that in which it may be deficient, the substance required, either to correct the evil or supply the deficiency, may not be at hand. Thus, a soil may superabound in sand, or exhibit a poisonous salt of iron; but alumen or pure lime may be unattainable, unless at an outlay which would neutralize the benefit to be derived from the use of either. Fortunately, however, science can go a considerable way towards procuring an artificial remedy, and thus tend to supply the deficiency of the natural one; but as I must recur to this subject hereafter, I shall not dwell upon it now.

It is somewhat unfortunate that the "*Essay on Calcareous Manures*" was written expressly for America. Mr. Ruffin, it is true, makes frequent allusions to the theories and experiments of British chemists; but his own observations and analyses apply purely to the soils of the United States—to that part at least of which he observes, "no chalk is to be found in our country, and it is only from European authors that we can know any thing of its agricultural characters, when nearly pure, or when forming a very large proportion of the surface of the land."

Mr. Ruffin's arrangement, however, of the three principal earth, is clear, precise, and correct; as is also his general conclusion at the end of the before mentioned page, viz. "the mixture of the three earths, in due proportions, will correct the deffects of all; and with a sufficiency of animal or vegetable matter, putrescent, and soluble in water, a soil is formed in which plants can extend their roots freely," &c. &c.

But he, perhaps, labors under an error in supposing that all the earths, when pure, "are entirely barren; or that *chalk*, alone, could give them the fertilizing principle." The only soil which I have ever met with, that has appeared to be wholly destitute of calcareous matter, (or, at least, that which affords no trace of it to the muriatic acid test,) is a black bog peat; but in this soil a few plants will grow with extreme verdure. It does not appear to me that the absence of calcareous earth is the sole cause of the general sterility of turbary soils; I refer it to the situation in which they are originally produced, and in this point, a remark made by Mr. Hayward will apply very pertinently. In the paper on the *Food of Plants*, which precedes *the Essay*, and in the middle of the page 197, it is observed: "if a quantity of the leaves of trees be collected, and immersed in a cistern or pool of stagnant water, and permitted to remain undisturbed for three years, they will be decomposed, and in appearance will be in that state, which, placed on the surface of the earth, should form a fertilizing substance; yet it will be found so sterile that no plant will grow in it."

Now the true peat mosses are formed, in the large way, in a manner analogous to the earth of decayed, immersed leaves, above described; that is, a bulk of vegetable matter is burried, and becomes sodden under water. Now leaves, and, indeed, vegetable substances in general, if burnt, yield a great abundance of *carbonate of lime*, as indeed, Mr. Ruffin asserts; therefore, though it may be presumed that, while in a growing state, these substances contain no *chalk*, properly considered as such, yet the elements of that earth must exist in them, otherwise it could not be revealed by the action of fire. Inert vegetable soils then, may originate in the peculiar action of water upon them, while they are deposited in a situation from which atmospheric air is excluded. This, too, accords with Mr. Hayward's idea, and it appears to be well founded. One of the most energetic loams which I have ever tested, contains merely a hint of *conbonate of lime*; it is of a fine, ochrous color, a velvety, unctuous texture, and when washed by various effusions of water, yields nearly three fourths of its bulk of impalpable matters, the remainder being a moderately fine silicious sand. When muriatic acid is applied to the fine matters, it produces little effervescence, and detects scarcely two per cent. of chalk. This loam is applicable to almost every species of plants; far more so than many earths which contain three times the proportion of chalk named, with double the quantity of warm sand. But if calcareous matter be the principal meliorating medium, the quantity required must be small indeed, if that in the loam just alluded to be sufficient to establish the fertilizing principle.*

* The soil, containing "scarcely two per cent. of chalk," is abundantly calcareous to have acquired, and to retain all its fertility, according to to the theory maintained in the Essay on Calcareous Manures. Any quantity, however minute, of CARBONATE of lime found naturally existing in a soil, proves that there

The first proposition of the Essay refers chiefly to the hypothesis that "soils naturally poor, cannot be permanently enriched;" and, "that the labors of man have been but of little avail in altering the characters and qualities given to soils by nature."

In as far as this view extends, I heartily assent to the opinion of the Essayist, and on the ground which I, for some time, have afsumed—that, "soils, be their nature what it may, tend to reduce manuring substances to earths of their own precise quality;" and in accordance with this doctrine, I hold it highly probable that the ultimate end of manuring is to support and maintain the quality and bulk of the staple soil.

Earth may be gorged with manure, but it is not thereby enriched. Plants may be rendered richly luxuriant in a gorged soil, but their health and vigor are not thereby increased. A medium state of soil, wherein it contains a prper quantity of enriching decomposable matters, is most favourable to healthy and robust vegetation; and in it those matters soon disappear, and nothing but earth remains after a few crops have exerted their energies upon the soil. Any one who has witnessed the effects of sand upon a very liberal supply of manure, after a crop has been taken, will not be at a loss to determine what the terms "barren" and hungry, mean when applied to land. Strong loams, on the contrary, hold the manures unchanged for a considerable time when not cropped, and retain the active principle more tenaciously by far, than light sands, even when severely cropped. Now it is certain that every correct analysis has proved the convertibility of farm-yard manures into, not only the elements of vegetables, but also into the three staple earths themselves; if then, a hungry sand, after a liberal system of manuring for years, still return to its original state of poverty, what must have become of the *alumen*, the *carbonate of lime*, and the *oxide of iron*, which the manuring substances were capable of yielding under certain conditions, to say nothing of the oxygen, the hyrdrogen, the carbon, and the azote, all of which gaseous products, may be presumed to have been taken up by vegetable vital action.

Every fact that I am aware of, seems to prove—first, that vegetable action tends to decompose manuring substances within the soil: secondly, that these substances are either wholly consumed, or deposite a residuum which is percisely similar in character to that of the natural earth, leaving it, whether it be sandy, clayey, or loamy, neither more nor less rich than it was in its original constitution. If this view of the results of manuring be correct, then Mr. Ruffin's first proposition is so far, to all intents and purposes, established.

The second proposition of the Essay unfortunately refers almost exclusively to the soils of Virginia, but one point of it, which is of great interest, is contained in the following lines—"The abundance of *putrescent vegetable matter* might well be considered the cause of fertility, by one who judged only from lands long under cultivation."—"Vegetable matter abounds in all rich land, it is admitted; but it has also been furnished by nature, in quantities exceeding all computation, to the most barren soils we own." The author then proceeds to state, that calcareous earth—by which term he always intends to express *chalk*, i. e. *carbonate of lime*—is "the cause of fertility, and the cure for barrenness."

The arguments are well sustained throughout theremaining part of the Essay, and prove the value and importance of chemical knowledge: they are, however, far too extensive to permit of being minutely investigated, and, indeed, may not be generally applicable to the soils of England. However, it would be highly desirable that particular attention be given to the facts adduced, in all districts where peat mosses exist, or have been recently reclaimed, for therein vegetable remains abound; and though these substances contain the elements of calcareous earth, they also are replete with those of vegetable acids, inasmuch as they are chiefly composed of oxygen, hydrogen and carbon—the bases of all such acids. The presence of acids need not therefore, be questioned, though they may not be traceable as such, being taken up and neutralized by the chalk, or alkalescent mattters with which they come in contact as they are produced.

The sterility of pure peaty soils, and their incapability of improvement by manuring substances, tend much to strengthen the second proposition, as does the fact that paring and burning are found experimentaly, to be meliorating processes of great efficiency; and why? simply, because the agency of fire decomposes the vegetable matters, destroys the acidifying elements, or, to speak more correctly, disperses them in the form of gasses, or aqueous vapor, liberates and fixes the carbonate of lime, and a portion of free carbon, and perhaps, (generally) a little carbonate of potassa, also. Here, then, we perceive another proof of the importance of chemical science, for nothing else could ascertain the results of the combustion of the peat, or refer them to their proper causes.

Mr. Ruffin's observations prove the correctness and accuracy of his analysis and conclusions. *All wood ashes*, as I have proved by reiterated experiments, and asserted, do contain *carbonate of lime*, and some other neutral alkaline salts, but whether these saline compounds have been furnished "by soil on which the plants grew," as he supposes, is to me a matter of some doubt. The *roots* are the media which connect the plant with the earth, and the *leaves* expose it to the influence of light and air; of these facts there can be no doubt; but several experiments with the sap of a bleeding vine, have led me to hesitate on the subject of the components of that fluid. I have not been able, as yet, to detect the presence of carbonic acid in it, but future experiments may furnish more decisive evidence than any which have yet come under my observation; still however, I lean to the opinion that, it is by no means from the soil alone that plants derive their specific juices. When we perceive that *aerolites*, containing metalic compounds of a peculiar nature, are formed in the atmosphere; that masses of hundreds of pounds in weight are precipitated from the air to the earth—(admitting the records of these startling phenomena to be founded in fact)—we need scarcely doubt the possibility of the convertion of the elements of water alone into all the specific secretions of plants, through the agency of light and air.

But, be this as it may, the theory of the neutralization of the vegetable acids by the carbonate of lime, naturally existing in the soil, is at once bold, novel and extremely plausible. The whole tissue of arguments adduced, are very ingenious and philosophical; and though they do not apply with equal force to the soils of Britain, are highly important to the philosophical agriculturist.

Nothing can be more correct than the assumption that vegetable matters under fermentation, (which is a chemical change of the constituents of dead vegetable matter, effected by the play of electrical affinities,) produce acetic and carbonic acids, perhaps also the muriatic acid; and these would be taken up in their nascent state by any alkaline substance existing in the soil. Acetic acid would be carried off, were it not fixed by some chemical agent; but if met with lime or potass, a neutral soluble compound would be formed; such, to an extreme degree, is the acetate of potass, a salt so greedy of water, that it liquifies if it be exposed only for a few minutes to the action of the atmosphere.

Leaves, and most vegetable bodies, affords manifest proofs of the presence of salts, particularly of salts of lime; not that they contain any chalk in its pure state, but they, in many instances, yield it to the mineral acids by mere digestion in them, without having undergone combustion. Thus, while we attest the truth of the chemical law adduced by Mr. Ruffin—that if any combination of lime with a vegetable acid "had been taken up into the sap vessels of a tree, it would be decomposed by the heat necessary to convert the wood to ashes; the acid would be reduced to its elementary principles, and the lime would immediately unite with the carbonic acid," produced by the process of combustion; we feel assured, by the evidence of facts, that mineral acids may attract from *green* vegetable substances the calcareous matters which lie masked among the cells of the plant, in a state of union with some unsuspected acid. I have thus detected, or rather produced, carbonate of lime, by digesting some sorts of moss in a weak cold solution of muriatic acid. I have also found a considerable portion in the leaves of a pine apple, but not to equal that which was yielded after combustion.

The combustion of vegetable remains, as leaves, haulm, sticks, and all such refuse, offers the ready means to furnish calcareous matters and alkali to land that is deficient of those important substances, in cases where it may not be easy to procure them in bulk. Many have objected to the process of burning, styling it a wasteful expenditure of manure; and so it may be considered if a soil be ill supplied with decomposable matters; but it is self-evident that, if a farm-yard manure be abundant, and the land of a light friable nature, void of chalk; or, on the other hand, if it be clayey and too adhesive, the products of combustion must offer meliorating substances of first rate quality.

I cannot now dwell upon Mr. Ruffin's observations concerning the original constitution of what he terms *neutral soils*, or notice the changes they may have undergone; these considerations, and others which refer to his remaining propositions, must be, for the present, deferred.

I regard his essay as a master piece; he has therein practically demonstrated the importance and vast utility of chemistry. His knowledge of refined processes may,

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had been enough for its use and benefit. The author of the Essay was far from maintaining that the proportion of CARBONATE of lime found in any soil, was the measure of its fertility. The quantity originally given to soils, by natural causes, when not excessive, and under like circumstances, might have served to measure the power to acquire and fix fertility. But in the course of reaching that end, the lime is supposed by combining with vegetable acid, to cease to be the carbonate, and is no longer detected in that form. This soil which Mr. Towers scarcely considers calcareous—or as containing "merely a hint of carbonate of lime," is in fact better supplied with that ingredient than almost any natural soil in our Atlantic States—not even excepting our limestone soils. Indeed, the only soils more calcareous, are the few and very limited spots on which shells have been deposited.—ED. FARM. REG.

perhaps, as he leads us to infer, be somewhat limited; but he has shown that he knows enough to analyse correctly, to describe accurately, and to apply the principles of chemistry with the best effect.

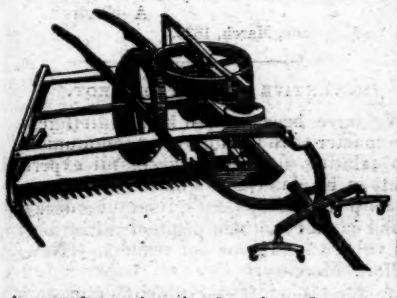
I trust we shall soon be favored with the remaining parts of his essay, for science owes him much, and its friends cannot but be delighted with the aid she has received at his hands. A few more such papers, widely disseminated through the most influential channels, could scarcely fail to convince the most sceptical, that he who could thus apply to the operations of husbandry the scientific principles which he has acquired, must be, in every way, qualified to make the most of his land, be its quality what it may; and thus to increase his profits while he improves his practice of agriculture, and calls into action the utmost productive power of his farm by a liberal, but wisely directed system of tillage.

G. I. T.

October 21st, 1835.

From the Cultivator.

AMBLERS' MOWING MACHINE.



Annexed we give the drawing of a mowing machine, which has been recommended to our notice, but which we have not seen in operation. The grass is cut by a scythe extending along above the teeth or comb, 6½ feet long, which has an alternate movement to the right and left when the machine is in motion. It cuts a swath 5 ft. wide, and about an inch and a half above the surface of the ground. The grass is left upright where it grew, which facilitates its drying, and saves the labor of spreading; and it is said the machine can be used upon all surfaces where the revolving horse rake can be used. It is furnished with three spare scythes, which may be shifted at pleasure in two minutes. About 100 acres of grass were cut with the model machine last season, in Columbia county, and at the rate, it is stated, of an acre in two hours. The machine is drawn by two horses, which travel on the mown grass. The price is from $60 to $70. Any further information may be had by addressing Messrs. Beale & Griswold, Spencertown, Columbia county, who are the proprietors of the patent right in the counties east of the Hudson, including Long Island, and in Massachusetts and Connecticut. Gentlemen, in whose opinions we repose confidence, assure us, that the machine is a valuable acquisition to our husbandry.

From the Genesee Farmer.

BREAKING AND MILKING COWS.

The proper management of cows to render them gentle and tractable, is a thing of the first importance. The unpleasant consequences of attempting to milk unsubdued and irritable animals,—the loss of a swimming pail of milk,—"the long face, the grave step, an apology and an empty pail,"—it is certainly always desirable to avoid. Even cows of naturally mild and gentle disposition, (for there is a great difference in them, as in almost all animals,) are sometimes completely spoiled by injudicious treatment. Where no system of management is adopted, and where animals are punished for bad conduct, merely as the convenience, caprice or passion of the milker dictates, it is not to be expected that they will improve in manners, or become otherwise than a terror of female, and finally, of male milkers.

Whenever young cows show any thing of a rebellious disposition, the first thing they should be made to feel, is the *superior physical force* of man, in a decided and effectual manner. As soon as this is felt, the animal is overpowered, and prefers surrendering at once to contending further, to manifest detriment. The best way to effect this, is to shut the animal up, and immediately accustom it to handling on every part, speaking to it at the same time in a loud firm voice, a single word at a time, and at intervals. It will thus become familiar to us, and become conscious of superior power. This consciousness will be more strongly produced, if the handling be firm and even rough. An animal should never, for the same reason, be spoken to in a *coaxing* voice, though a kind and soothing tone should always be adopted whenever it manifests submission. If it should show a disposition to resist, as by kicking, the act should be followed *instantaneously* by a *single* stroke of a whip, or other punishment. If this is *invariably* adopted, the animal soon submits, not finding it pleasant or profitable to resist. But never punish an animal unless it can be done instantly after the commission of the offence, and never strike but once; and above all, never get in a passion, for this will certainly spoil the whole. If an animal thus finds that bad behaviour is always followed immediately by punishment, and that submission is always attended with kind treatment, it soon learns to distinguish one from the other; and a change in its manners is wrought in a remarkably short space of time. We have seen cows of several years of age, and apparently of almost incorrigible ferocity, completely metamorphosed in this respect, so as never, for years, to show the slightest disposition to resist or disobey; but on the contrary, to become even attached to their master. We need not ask how much more humane to the animal, or pleasant to the keeper this is, than where a different course is pursued.

It will assist materially in the breaking of young cows, to accustom them to be frequently handled from the first year; and to enable them to acquire a familiarity with the voice and presence of man.

A heifer should never be allowed to have a calf till the early part of summer, or if deferred even until nearly the middle, it will be no detriment. It will then be most vigorous, and there will then be a better supply of nutritious grass for food, which will cause a more perfect enlargement or swelling of the udder. The period of gestation in the cow, is, on an average, two hundred and eighty-seven days, or forty-one weeks, with a bull calf; a cow calf comes one week sooner.

The best cow may be spoiled by not milking clean; too much attention, therefore, cannot be paid to this subject. The udder should be perfectly drained to the very last dripping; for besides the extreme injury ultimately caused to cows by leavnig a part of the milk, the last milk is always far the richest, according to the remark of an experienced Cheshire dairyman, "each succeeding drop the cow gives at a milking excelling the preceding one in richness."

Sore or chapped teats, so common an evil, may be very effectually prevented by washing them perfectly clean with cold water always before milking. Very bad cases have been thus perfectly cured in a few days.

From the Genesee Farmer.

LETTERS FROM A FATHER, LIVING IN THE STATE OF NEW-YORK, TO HIS SON IN WESTERN PENNSYLVANIA, ON THE ADVANTAGES OF KEEPING LIVE STOCK, THE IMPORTANCE OF HAVING GOOD BREEDS, ETC.

Having taken a cursory view of the principal crops cultivated in the country, and having noticed the quality of soil and manner of culture adapted to each, and in some instances their comparative value, I am now ready to take my leave, as to these letters, of this department of husbandry. I take my leave of it accordingly, and bid it farewell.

There is another department of rural husbandry which, if I am not mistaken, offers to you, and your fellow citizens, peculiar inducements to become interested in it. I allude now to the breeding and rearing of domestic animals, and the various uses in which they are susceptible of being rendered serviceable to man. It does not appear to me that your farm, or any other in your immediate neighborhood, is so well adapted to the growth of grain as to the several uses of grazing. Nor is it, in my view, likely that Western Pennsylvania, in general, will ever be distinguished as a grain growing, and especially as a wheat growing country. For other attributes, not less desirable and important, it may be, and probably will be, highly distinguished. Who that has witnessed the fine pastures of white clover that are to be seen there in all directions, can doubt that the country is admirably adapted to grazing purposes? The inhabitants of that country should listen to the voice of nature, and yield prompt obedience to the lessons which she teaches. What says nature? What is the language which she speaks, in exhibiting those fine pastures? Most certainly it is, bring hither your flocks and herds. It is hard to struggle against nature. To make the culture of grain the primary and leading object, while nature clearly points to another and better way, is little else than rebellion against her sovereign mandates.

It is my opinion that you have not given that attention which your interest requires to the breeding, rearing, and proper use and management of live stock. I did not see about you such specimens of fine stock, especially young stock, as would have been pleasing in my sight. Yet I do not intend to single you out as the only delinquent. It did not appear that your fellow citizens in general had done better, in this respect than yourself. In regard to the husbandry of domestic animals, the whole country around you is behind what it should be, and far behind its own int rest.

Good breed is the first requisite towards good husbandry, in regard to live stock. The rule noticed in one of my preceding letters, that the more perfect the parents are, the more perfect the offspring or progeny may be expected to be, applies certainly no less to animal than to vegetable tribes. A particular regard to the princi-

ples of this rule is absolutely essential to successful enterprise in the husbandry of live stock. Yet it is believed few good rules for the regulation of human agency are less regarded. By many it seems to be considered as a matter of indifference what animals, whether good or bad, are employed for the propagation of their species. Very inferior animals are often employed for that purpose, and it rarely fails that the consequences are just such as should have been expected—a degenerate and worthless race of animals. I know not to what extent you and your fellow citizens have practised such indiscretions. I regret, however, to say, that the specimens of live stock which I saw in that vicinity, did not afford satisfactory evidence, that the general practice there had been in these respects altogether unrebukable. To excite in your own mind, and among your neighbors and fellow citizens, proper inquiries relative to the importance of entering more deeply than has been done in that place into the husbandry of domestic animals, and of practising therein according to the principles of economy, is the object at which I am aiming while I write this letter.

It has been suggested, that the first step to be taken towards improvement in the branch of husbandry now under consideration, is to procure good breeds of animals. This is a fundamental concern, and it is scarcely possible to attach to it greater importance than justly belongs to it. Will not the farmers who compose that respectable agricultural community with which you are connected, agree to act in concert for the accomplishment of a revolution in their practice, in conformity to plans herein suggested? Owing to the liberality and practical enterprise of sundry public spirited gentlemen, the best breeds of European stock have already been introduced among us, and are now to be found in almost all parts of the country. It is, I believe, universally admitted, that these breeds, some of them at least, go far ahead, in point of excellence, of any thing that can be found among our own native breeds.

Do you, or do your fellow citizens, desire to become possessed of one of the best breeds of cattle, or the very best that ever grazed in the pastures of any country? I apprehend you need not travel far abroad to find such a breed. Certainly you need not go for that purpose much beyond Buffalo, perhaps not half that distance. LEWIS F. ALLEN, Esq. of the city just named, supposed to be one of the best judges of live stock, has taken unwearied pains to procure the best breeds of cattle. We are credibly informed that he has been successful in his enterprise. It is believed that gentleman has now in his possession on Grand Island several fine bullocks of the improved Durham Short Horned breed, graded differently as to blood, which he will dispose of to his fellow citizens on fair terms. Many other gentlemen in Western New York, and other parts of the same State, are also in possession of highly improved breeds of cattle. But why speak of N. York, as if good breeds of cattle could be found only in that State? Good breeds and good breeders of cattle abound in your own State no less, to say the least, than in any other.

Since then, there are in the country, and not far from you, the best breeds of cattle, can it be supposed that you, and your agricultural neighbors, are doing yourselves justice while you neglect to become interested in them? If gentlemen who understood their own interest, have thought it an object worthy of their attention to send to Europe for good breeds of live stock, is it no object to you to avail yourselves of such breeds, when they are brought near to you, and can be obtained at a trifling expense? It does not appear that farmers in general consider as they should, how great the difference in value is between bad and good, or inferior and superior stock. They are inclined rather to estimate the value of their stock according to its numerical amount, counting the number of animals of which it is composed. This is a fallacious rule of estimating. It should be considered that a single animal of superior breed and excellence, may be worth more for the market, than some dozens of such as generally compose the stocks of this country. For illustration of this remark, I refer you to a recent sale of cattle in the State of Kentucky, published in the Genesee Farmer, current vol., No. 5. It will be seen that a single heifer calf, 8 or 9 months old, was sold for $295. One cow was sold for $300, and several others nearly as high. It is true, these were breeding prices, and if the cattle had been sold for other uses, such prices could not have been sustained. Nor is it to be expected, that when cattle of the best breeds shall have become plenty in the country, such prices can be sustained even for breeding. Yet the difference in value between inferior and superior animals, will always be very great.

It is believed my object in making the preceding remarks cannot be mistaken. I have been laboring to convince you, and that cluster of farmers with whom you are connected, that effectual measures should be taken to improve your breeds of live stock. I am not, unaware, however, that neither yourself, nor any other individual in the neighborhood to which you belong, may have money to spare for the uses that have been suggested, nor be able to spare the time that will be requisite for accomplishing the objects which have been recommended. For such reasons it may be feared my counsels will fail of having their intended effect. Permit me then, further to remark, that farmers have in many respects a common interest, and the better to manage that interest, they would do well, in many instances at least, to form themselves into small associations. Should it become the practice of farmers, *every where*, and in all little farming communities, to form themselves into such associations for the better promotion of their general interest, incalculable advantages would be the results. Such associations should be regularly organized, and have stated periodical meetings for consultation and action on subjects equally interesting to all the members. There should also be rules and by-laws for the better regulation of such associated communities. To every such association a treasury, containing a small amount of public funds, should be considered as an indispensable appendage. If then an association of farmers in the vicinity to which you belong should be formed after the plan here suggested, what useful purposes would it answer? It almost appears to me that the question admits of an amendment, and should be amended so as to read, What useful purpose might it not answer?

At the meetings of such societies, the members might communicate to each other much useful intelligence relative to practical husbandry—suggest plans of improvement—adopt measures for improving their breeds of stock—agree how to practice when their territories are invaded, or threatened with invasion, by pernicious weeds, such as Canada Thistles, Johnswort, Daises and the like. Indeed, the useful purposes to be answered by such associations as have been suggested, are too many to be readily enumerated. It should be known, that while individual effort is feeble, combined action is powerful and irresistible.

To apply the above remarks to the case more particularly in view, it remains for me to say, that the farmers of your neighborhood should agree to act in concert, relative to adopting and pursuing measures for the improvement of their live stock. If no individual is able or willing to assume the expense or take upon himself the responsibility of introducing good breeds of stock, still this should be done by the combined agency of twenty or more farmers. Let a public purse, made up of individual contributions, be provided for this purpose. Let a discreet citizen, who should be a good judge of live stock, be appointed general agent, and let him go abroad in search after good breeds of cattle. By such means let a good bullock be introduced among you—let him be committed to the care and keeping of some one who is known to be a faithful and skilful manager of cattle stock—and let the privileges, profits and expenses, be justly divided among the members of the company.

A FATHER.

New-York State, March, 1826.

PREVENTIVE AGAINST DRY ROT.

We have been favored by an intelligent ship master with the following communication relating to recent successful experiments in England in the means of preserving ship timber against premature decay, which cannot fail to be of practical interest and value to many of our readers.—[New-Bedford Mercury.]

Mr. Lindsey:—If you think the following description of the method of preserving timber from rot, insects and worms, now universally adopted in England, is of importance to the public, you will confer a favor by giving it an insertion.

The writer of this is personally acquainted with the ingenious inventor—has attended the lectures in London on the subject, and is satisfied of the efficacy of his plan.

The material employed by the inventor is Corrosive Sublimate, long known as a great preservative of animal substances from decay. The timber to be prepared must be placed in a tank or vessel, from 40 to 80 feet long, 4 or 5 feet deep, and about the same width. A solution of the corrosive sublimate is then thrown upon it until covered; the proportion, according to the inventor, is 1 lb. of corrosive sublimate to 5 gallons of water—but individuals who have tried it, say 1 lb. to 10 gallons of water. Pine plank are saturated in 48 hours. An oak stick, 40 feet long and 1 foot square, requires three weeks—during which time it becomes effectually seasoned, and will not contract or shrink even on exposure to the highest temperature of a tropical climate. The corrosive sublimate has a strong affinity for the albumen or vegetable juices generally called sap, combines instantaneously with it, and forms a new chemical compound which is solid, insoluble, and will not attract moisture. The efficacy of this invention has been tested in the most extraordinary manner. Pieces of the timber prepared with a solution of the sublimate, and unprepared pieces, the latter well seasoned, were placed in the "*Rotten Pit*," at the King's Dock Yard, Woolwich, in 1828. In 1831, the writer of this was present when

they were withdrawn. The prepared timber was perfectly sound—the unprepared, although of the best English oak, was a mass of rot and decayed vegetable matter.

The prepared sticks were left on the ground in the open air six months, and then again placed in the Rotten Pit, with other pieces of well seasoned timber. At the end of two years the prepared timber was found quite sound—the seasoned very rotten.

The Rotten Pit, at Woolwich Yard, is a cave under ground, 80 feet long by 20 feet, and built by order of government, for the purpose of testing the efficacy of the various proposed nostrums for preserving timber. The pit is lined, top, bottom and sides, with vegetable matter in the worst possible stage of corruption—very damp and full of carbonic acid gas—it is a perfect hot-bed—a candle will not burn in it a minute, so foul is the air of this subterraneous chamber. In fact, no timber, although thoroughly salted, docked, or seasoned, will resist three months the powerful decomposing qualities of the Rotten Pit. The specimens were placed on the bottom of the pit, and half buried in the putrid vegetable matter with which the cave is kept supplied. This experiment seemed so conclusive, that Government immediately paid the inventor £10,000, and advised him to take out a patent. He was ordered to construct tanks at all the Dock Yards, and the government timber was immediately prepared in the above manner. Previous to this, individuals had fitted tanks, and two whalemen were built entirely of timber and plank prepared with the solution. House builders are also using it very generally in London. The sleepers, or foundations for railways—staves for oil casks, canvass, rope, and all vegetable matter, may be preserved by its use. It is found that a cubic foot of oak, will absorb three pints of the liquid, which will cost at the present price of quicksilver, 7½ cents per cubic foot. A mere trifle compared with the immense advantage of having a material not liable to be destroyed by rot, worms, or insects of any kind. The objection urged against this material, is its poisonous nature. But it has been proved by careful experiment, that corrosive sublimate, when it combines with the sap of wood, forms a compound perfectly insoluble, and quite innocent—in fact, a complete chemical change takes place in the poisonous nature of the mixture by this combination.

The writer has seen experiments tried upon canvass and rope, which was immersed in the solution, and placed four months in a dunghill—the unprepared pieces were destroyed—while the texture of the prepared specimens was not weakened in the slightest degree—any one can try this by using the above proportions.

Satisfactory accounts have been received by Messrs. B. Rotch and M. Enderby, of London, from the captains of the whale ships constructed at their instance, of timber prepared as above—testifying that the crew were remarkably healthy, although they slept actually in contact with the ceiling plank thus prepared, through all climates and changes of temperature.

It is well known to practical men that salt is not an effectual preservative—as many ships salted on the stocks, have been found rotten the first voyage—one instance, the Enterprise of Nantucket. The Golconda, of New-Bedford, has had a new windlass three voyages in succession, and the lower masts of ships very quickly decay. These parts of a ship it is impossible to salt. In the British navy, the use of salt has been discontinued, as it is found to corrode the iron rapidly, and it also keeps a ship in a very damp state.

REMEDY FOR THE CROUP.

The Medical and Surgical Journal of March last, contains a communication from Dr. J. D. Fisher, of this city, describing a new and successful mode of treating that alarming disease of childhood, the croup, which ought to be generally known. The prescription is simple, and easily applied, and it must be evident that if it should not afford effectual relief to the sufferer, it will not increase the disorder. In the absence of a regular physician, this application may in some cases prove of immense benefit. The following is the statement by Dr. Fisher:—

"I was called, at five o'clock, last evening, to a child which was laboring under a severe attack of the croup, consequent upon a sudden disappearance of the eruption of measles. The croupy symptoms appeared suddenly, and had existed one hour before I was called. The child, on my arrival, was in extreme agony, struggling and gasping for breath; and I thought the little sufferer was in danger of immediate suffocation. The first means I employed was the application of very hot, almost boiling, water to the throat and upper part of the chest, by means of large sponges. These applications I repeated every two minutes, and immediately the skin became coated and very red, and in the course of a quarter of an hour the little girl breathed much easier, and her croupy cough and respiration became less shrill and tubular, and much modified. Soon after making the first application of the sponges to the throat, I wrapped the child in a woollen blanket wrung out in hot water, as a substitute for a warm bath, and gave it twenty drops of the wine of antimony, in a little sweetened water, which she swallowed with difficulty. I persevered in the applications of the hot moist sponges for an hour, when the child was so much relieved that I ventured to leave it for half an hour—ordering the remedy to be continued. On my return, I found the patient breathed with comparative freedom, its respiration and cough less sonorous and shrill, and its pulse softer and more natural. I recommended the applications to be continued until the child should be decidedly relieved, and prescribed six drops of antimonial wine to be given every hour in a little water. The mother of the child informed me, this morning, that she continued to apply the hot water remedy for five hours, but not so often as I applied them—that the child continued to improve, and fell asleep soon after I left it. This morning she is bright and playful, and asks for food. The respiration is quite easy—pulse soft and natural; cough humid and loose; its sounds having lost the shrill croupy character.

I was induced to employ the above remedy, in consequence of having lately read in a foreign journal, that it had been suggested and employed by a German physician with decided and uniform success. As the remedy is simple, and is at ready command, and as its application in the present case was attended with such decided and immediate happy effects, I would, with a good deal of confidence, advise mothers and nurses in similar cases to apply it early and perseveringly until medical aid can be obtained. The sponges should be gently squeezed before they are applied, so that the water shall not ooze from them, and should be gradually compressed during the time they are applied, so as to continue the temperature up to the highest degree that can be sustained by the patient. Should sponges not be at hand, napkins wrung out in the boiling water may serve as good substitutes."

SOWING CLOVER SEED.

Extract of a letter from a subscriber at Cayuga: "As the time for sowing clover seed is approaching, some note in your paper of practical farmers on that subject may be of some service, and save some the trouble of complaining of the loss or failure of their expected crop of clover. For several years past I have practised sowing my seed the last of March or 1st April, when we have frosty nights and thawing days. The mornings then are generally still—the surface of the ground is raised by the spars of ice formed during the night—and if the seed is cast on the ground such mornings, it finds its way through the crevices occasioned by the ice beneath the surface of the earth sufficiently deep to protect the young plant from the drouths of April or May, by which our clover crop is frequently destroyed, if the seed is sown when the surface of the earth is compact. Since I have practised in this way, I have not failed in a single instance of having a full crop of clover."—[Genesee Farmer.]

FLEMISH MAXIM.—"No forage, no cattle; without cattle no manure, and without manure no crop." Upon the cultivation of clover, in the alternating system, says Radcliff, hinges apparently, the whole of the farmer's prosperity. It is the summer support of all his stock, which are kept in paved stables summer and winter. The first cutting of clover is used for soiling, and the second for seed. Two cuttings from an acre will support four cattle from May to October. Ashes are sown upon clover in February, at the rate of forty-five bushels the acre. Without clover, continues our author, no man in Flanders would presume to call himself a farmer.

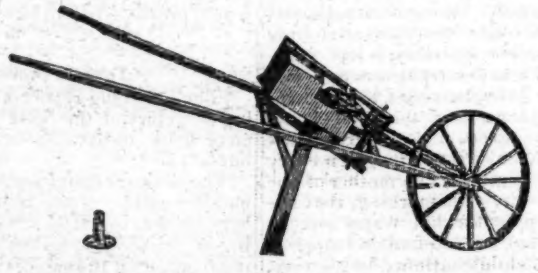
From the Cultivator.

[The following report of the Corresponding Secretary of the State Agricultural Society came to hand too late for its place in our last.]

The corresponding secretary of the agricultural society of the State of New-York, begs leave to report, that since the last meeting of the society, he has received no communication on the subject of agriculture of sufficient interest to lay before this meeting. The establishment of papers having for their express object the diffusion of information on the different branches of husbandry, and their extensive circulation, has, in a measure, superseded the necessity of corresponding with the secretary of this society. Many gentlemen now send their communications through those papers immediately to the public, which is probably the best disposition of them that can be made, inasmuch as they are of public interest, all who wish to be benefitted may peruse them at an early day. Although he is happy to perceive and be informed that communications through these channels are becoming both more numerous and interesting, yet he would still, in behalf of the society, solicit a correspondence on subjects connected with its objects, with gentlemen who may be dis-

posed to favor him with their communications, in the hope that these communications might tend to give more interest to our annual meetings. So far as at this time as this is subject of regret, it may, perhaps, be construed into an evidence that this society does not so fully meet the expectations of its friends and supporters, as could be wished, or that the public feel indifferent as to its complete success. Still, with this discouragement, after the labors of three years to extend its usefulness, he trusts that we will by no means abandon our design, or falter for a moment in our efforts fully to carry out the contemplated objects of this necessary, and let me add, noble institution. At the time of its organization, it commenced under many discouraging circumstances. The former State society had not only dissolved, and the county societies followed in its train but there existed an apathy upon the subject of agriculture, and a repugnance to the new organization of similar societies, from the circumstance that all had failed. The causes of this failure it is now useless to recount; it is enough to say, that the public had to be awakened once more to the subject of agricultural improvement, to necessity of concert of action, together with a vigorous use of every means to effect this object. The establishment of agricultural newspapers in different porttions of the State, has, perhaps, done more than any other means to bring about a change in public opinion; and what contributed essentially likewise to aid the friends of agriculture, was, that as all other classes of society were using extra efforts for their special advancement, the farmer found that his calling would fall into merited contempt without corresponding efforts were made on his part. Partial as were those efforts, and wanting, as a body, the farmers still are in the *esprit de corps*, a spirit so important to complete success in the various departments of human industry, still we feel that something has been done, but not so much as might have been wished, or even expected. In consequence of these efforts, however, we have seen, within a few years, an improvement in the appearance of farmers generally—the houses are better, the fences better, the lands more carefully tilled, and useless weeds and bushes oftener destroyed. The fields look cleaner; draining, so essential in some soils, and before hardly thought of, is coming into extensive use; the herds of cattle are oftener improved by the mixture with the imported breeds, they are better kept, and are decidedly becoming more valuable. The breed of hogs is more attended to, the fattening of them conducted in a much more economical manner. The improvement of horses has not been so manifest, but that of sheep has been decidedly so—much more numerous flocks are kept, and both mutton and wool have increased in quantity and improved in quality; large flocks of sheep are now profitably fed where but few formerly were permitted to roam, and thousands of dollars are now received for wool, where once it was not thought practicable to obtain hundreds, under any possible change of circumstances. The subject of manures has undergone interesting discussions, and farmers find, that to improve their farms, their hay and grain must be consumed upon them. In short, there has been a manifest improvement—by it, the farmer has bettered his circumstances—as a class they are much relieved from debt, and many of them have become wealthy. An investment of money in real estate now yields a handsome profit: and last, though not least, their lands have nearly doubled in their value. That this society has done something towards these good results, cannot be denied; and that there is a better feeling prevalent among our farmers, is equally true, but it is likewise true, that our county societies are not sufficiently encouraged and supported; that few of them have had their annual fairs, and of those few the corresponding secretary has not been informed. He will only further remark, that under many discouragments our motto ought still to be *perseverance*, and if untiring industry will not insure us to success, we will at least show to the community that we deserve it.

J. P. BEEKMAN,
Corresponding Secretary.



From the Cultivator.

ROBBINS' CORN PLANTER.

MR. BUEL—SIR—Having been applied to by letter, from various sources, for a description of "Robbins' Corn Planter and Drill Barrow," and answers to the following questions solicited, I have concluded, with your permission, to reply through the medium of the Cultivator, should you deem them of sufficient importance to occupy a small space in one of your columns.

Question 1st. "Is Robbins' machine complicated, and liable to get out of repair?" *Answer.* At first view, it would appear rather complicated; but on further inspection and a trial, the complication ceases, and it becomes very simple. There is, however, but one way of placing the band on the pulley, for that must be turned with the sun, *i. e.*, the band should pass from the top of the nave or hub of the large wheel, to the left side of the pully or whir. Particular attention should be paid to this, as, by placing it the opposite way, the wire spring in the small circular box might be injured. The band is shortened or lengthened by twisting or untwisting. The speed may be accelerated or retarded by placing the band on the larger or smaller groove on the nave and whir. By increasing the motion of the droppers, the seed will drop faster, and, of course, nearer together.

2d. "What and how many kinds of seeds will it sow?" *Ans.* It has six droppers, with different sized holes, and will plant corn, beans, peas, broom-corn, beets, mangle wurtzel, turnips, teazles, onions, carrots, mulberry, and all kinds of round or oval seed not larger than corn or beans, with more system and correctness than can be done in the usual manner of planting with the hand and hoe. One man may easily put in five acres in a day, placing the seeds any given distance apart, from two or more inches, and in rows two and an half feet apart one way, and the rows at such distances as may be deemed best. In drills, one or more seeds may be dropped, at eight inches asunder.

3d. "Is it drawn by a horse?" No—it is pushed by a man or boy, like a wheel-barrow, but it is much smaller and lighter.

4th. "Will it answer for planting corn in hills of equal distances, in squares, over a large field?" Yes, it will plant corn in hills, dropping from three to four kernels at a time, two and an half feet apart; and, by a little experience and attention, being particuluar on starting the rows, the hills may be placed at right angles and at equal distances.

5th. "Will it regulate and drop any required number of seeds?" Yes, by using larger or smaller sized droppers.

6th. "What is the price?" Fifteen dollars.

To plant one acre of ruta baga, the rows twenty seven inches apart, and the seeds in the drill one inch apart, only from four to six ounces of seed is required.

In a letter from a gentleman who has had one of these machines in use for several years, I find the following observation, which I have taken the liberty of transcribing.

"The corn I planted with Robbins' machine, last season, on my farm, exceeded that planted with the hoe, by the acre, at *least fifteen bushels*, under circumstances equally favorable, as to soil and cultivation. And I have conversed recently with a number of gentlemen who have used the machine, and tried some experiments, and find that the result has been in favor of the machine in all cases, they think, *not less* than *ten* bushels."

Such is the description and character of "Robbins' Corn Planter and Drill Barrow," and I know of nothing wanting to make it perfect, except a roller, which I consider of very essential service to cover and press the earth on to the seed, which causes a more rapid vegetation. The roller may be attached by an additional expense of two dollars.

The above machines may be obtained at the seed store of WM. THORBURN, No. 347 North Market-street, and of the subscriber, No. 80 State-street, Albany.

C. N. BEMENT.

Albany, March, 1836.

HINTS ON GRAFTING.

J. BUEL, ESQ.—If you deem the following hints on grafting of any practical utility, they are at your service, the whole, or any part of them.

The method which I have practised, with excellent success, for eight years past, is as follows. I cut my cions as late in April as they can be, before the buds begin to swell, and keep them with the but ends in the earth, in a damp cellar. When the season commences for setting, which is as soon as the leaves begin to start, I set my grafts. I use a composition of two parts rosin, one of beeswax, and one of tallow, melted in a small kettle, and applied hot, with a small brush, which any one can make in five minutes, nicely painting over the end of the branch cut off, so as to cover the split, and prevent the air or wet from getting in. By this method, one can set much faster than

in the usual way of applying the composition cold—it requires less of it, and of apples or pears, not more than from five to ten per cent. need be lost. On other fruits I have not had much experience, but from what I have, believe it will succeed equally well. Respectfully,

LEVI HOPKINS.

Mentz, March 8, 1836.

From the Cultivator.

Coeymans, March 15, 1386.

FOR THE CURE OF THE BOTS IN HORSES.—Give them alum of the size of a small butternut, either pulverized in their feed or dissolved, and poured down when dangerous, and there is no doubt of an absolute cure. It should be given once a month, and they will never have bots. I learned it from a Pennsylvania German, and have practised it nearly twenty years with effect.

STEPHEN HAINES.

HEATING ROOMS WITH HOT AIR.

A correspondent in the south, whose communications we are always glad to receive, has furnished the following:

"I am much pleased with the article on Warming Houses with hot air; and will observe in addition thereto that heated air is but very imperfectly conducted through horizontal tubes. Heat has such a strong tendency to ascend vertically that but little will pass through tubes laid in that manner. Hence rooms that are directly over the furnace are made uncomfortably hot while those which require the heated air to be sent laterally only eight or ten feet, are scarcely warmed at all. This fact has been well tested in Philadelphia, and demands the serious attention of all who wish to adopt this mode of warming houses.

"One of my neighbors has a kitchen stove which had so little draught as to be nearly useless for heating the apartment, until the stove-pipe for convenience was extended into the third story, when the draught was so much increased as to enable him to burn damaged or half decayed wood in it, and to make the room comfortably warm."

Our ideas on these subjects coincide with those of our correspondent; and probably the result of an experiment on a cook-stove in our own kitchen might prove useful, if made public. The pipe entered the chimney scarcely six feet from the floor. It was placed low through fear that its heat would endanger the ceiling above it; and the consequence was, the stove frequently smoked. This discomfort has been almost entirely removed by raising the pipe rather more than a foot, which has materially increased the draught. It now enters the chimney about four inches below the ceiling; and to prevent the plaster from becoming heated, a long piece of sheet iron bent a little on its sides, so as to *lie lengthwise on the pipe*,—intercepts the heat in its ascent. With this contrivance, the ceiling is now less heated than it was before the pipe was raised.

If we consider a stove-pipe as an inverted syphon, we may understand why it may be lead horizontally from the stove to a *distance*, provided it afterwards ascends to a sufficient *height* to cause a draught; and the *height* ought to be proportionate to the horizontal *distance*. The levity of the air by heating is much increased; and the pressure of the atmosphere, being greater at the stove than at the top of the pipe, a strong current rushes along it. In the same way, if a tube for conveying hot air from a furnace, be made to discharge it into the second or third story, after being led to a distance horizontally, we should expect there would be draught enough to answer the intention; but when we undertake to lead heated air horizontally, and then discharge it at the floor of the first story, disappointment must ensue, because we have not proportioned the ascent or height of the pipe to its horizontal distance.—[Genesee Farmer.]

DESTRUCTION OF CANADA THISTLES.

The following is extracted from the letter of a subscriber dated Salina:—"In the Genesee Farmer of the 6th Feb. the question is asked by a correspondent, 'how can I with the least trouble destroy the Canada Thistle?' In my own practice I have found that the thistle should, in no case, be molested by the plough early in the season; but let them grow until they are as near maturity as possible, and not bring any of the seed so far forward as to grow, and then without delay cut them down close to the ground, and with a good team and plough invert the sod, and with the harrow, cultivator and plough, with great care, keep from growing above ground till the 20th of Sept. or 1st of Oct., which will be in time to sow wheat—then in the spring sow the large kind of red clover seed, say 12 or 15 pounds to the acre, with a dressing of 4 or 5 bushels of plaster. If there are any plants of the thistle discovered, let the clover be mowed two seasons successively, and let the dressing of plaster be repeated each season, and if the land is rich and good, the clover will smother any plants that might have survived the operations of the plough, *provided* there are no stumps or stones on the surface to prevent the work being faithfully done.

"Since writing the above, I observe that one of your correspondents, speaking of subduing the Canada Thistle, says, 'Plough in the spring, plant potatoes, and hoe,' &c. &c.; but in practice I have uniformly found that ploughing in the early part of the season has, in every case, added to their ability to spread, while on the contrary, to let them get their growth, and of course the strength of the roots becomes exhausted in a measure, then cut them down and plough them with care, the trouble of subduing them is comparatively small. Then, they should not be permitted to put their heads above ground long enough to breathe, but should have every plant cut off or turned under without delay."—[Ibid.]

SEASONED FIRE-WOOD.

We have travelled considerably in the course of this extraordinary winter, and have had opportunity to observe that too many farmers burn *green* wood. With some, indeed, it is not from choice, nor from negligence, except in leaving it corded up in the woods, instead of bringing it home at the proper season; for so deep has been the snow, and so difficult has it been to break roads and to dig out the piles, that many have felt constrained to cut the nearest timber trees that they could reach. This may be a subject of less regret, however, if they will learn wisdom from experience, and in future years depend as little as possible on the weather.

In regard to green wood, there is a great choice. Of our *worst* kinds we should set the elm perhaps, at the head of the list; and sooner than endure its simmering fires, we should be strongly tempted to burn old basswood rails, and then replace them as soon as we could in the spring. We are almost afraid, however, to recommend such a measure. Our farms get out of repair soon enough by the gradual operation of natural causes, and we should be unwilling to hasten such a state except through the pressure of necessity.

Although to burn some sorts of green wood would overbalance our patience, yet there are other sorts that are more tolerable; and the very best kind that we know of, is *white ash*. The farmer that can procure this for fuel, may live very comfortably, even when it is taken fresh from the stump.

We are aware that there is some discrepancy of opinion respecting the advantages of seasoned fire-wood. In "The Prompter," which was published many years ago, *green back logs* were allowed as proper, but no other kind of green fuel; and we are much inclined to respect the judgment of that writer. Only *the front side* of a back log ought to burn. It is more difficult to prevent a *dry* one from burning behind, and besides it is sooner consumed than a *green* one; and though a liberal portion of the heat generated by the latter, unites with the sap and passes off in a *latent* state, yet we think this disadvantage is more than counterbalanced by its *not* burning next to the back wall. For stoves, however, we consider it very unphilosophical to say one word in favor of *green* wood.

We copy what follows from a private letter; our thanks are due to the writer for many and similar favors. He is a farmer of the right kind; one that attends to his own business, and whose opinions are generally founded on the results of experience.

"Last winter and the present, we have been burning dry seasoned wood *with evident economy*, and a very considerable increase of bodily comfort. It is my intention to use no other kind in future. Several persons who have been in the practice of burning—or rather trying to burn—green wood, are now sensible of their error, and are willing to pay a small advance on wood that is well seasoned.

"It is a current opinion with many folks that cooking requires a greater quantity of *dry* wood to produce the same effect than of *green*; but I am now satisfied that this is a fallacy. These remarks serve to show that some at least are willing to quit old practices and prejudices, and to learn from experience."—[Ibid.]

From the Maine Farmer.

SCOTCH OATS.

Mr. Holmes:—It is a well known fact to you that the Kennebec County Agricultural Society, of which you were Corresponding Secretary, and of course did the business, imported, via. New-York, from Scotland, a number of bushels of Oats, in hopes that seed brought from that mountainous country to this, might be useful. The seed was sold at auction, and I purchased two pecks at one dollar the peck. As they arrived late I was obliged to sow them late in the season. I put them upon good land, and they grew large in the straw, but before they ripened were nearly all lodged down. On threshing them out, I found that I had eleven bushels, notwithstanding, compared with those sown they were very much shrunk and shriveled. Last spring I sowed five bushels on two acres and fifteen rods of land, in three several pieces, to try what they would do. The land was in various states of richness, some of it in good order, and

some of it poorer, some on a spear grass sod ploughed eight inches deep—with little or no dressing of any kind, the land having been mowed as long as it would give any burthen worth mowing. I raised between seventy and eighty bushels. From my experiments I think I may safely make the following statements, viz: That they produce larger, and more straw per acre, than the common oats. That they produce as many or more oats. That they are this year about five pounds in the bushel heavier, though not entirely full, as part of my crop lodged and all were cut too green. That they ought not to be sowed late. That they will produce more of oats and straw on land that is in rather poor condition."

That a decaying or rotten sward of any kind is sufficiently rich to ensure a good crop. That they will probably bring in the market 12½ cents per bushel more than the common oats of this country, and that it will prove a change of seeds that will be of much benefit to the farmer for a number of years to come.

I have fifty bushels which I will sell at a fair price compared with the price of other oats, if applied for at my house soon. The oats imported weighed 44 pounds to the bushel. ELIJAH WOOD.

Winthrop, Feb. 27, 1836.

A DISSERTATION ON THE MULE,

With the view of promoting an improvement in the breed; and of demonstrating the utility of employing him as a substitute for the horse, in the labors of husbandry, canals, &c. BY SAMUEL WYLLYS POMEROY.

* "——OPINION is the queen of the world; it gives motion to the springs and direction to the wheels of power."—JOHN QUINCY ADAMS.

"Knowledge is power."—BACON.

(Concluded from our last.)

As it is not requisite to pursue our history of the mule any farther among the ancients, we shall drop their appellation of *male* and *female ass*, and adopt the modern one of JACK and JENNET.

Spain has continued to support the reputation for a superior race of mules to the present period; and it is probable that the Arabian breed of Jacks were introduced by the Moors, when they held possession of that fine country, which, by crosses, and the effects of climate and soil, have formed two valuable races: which we shall notice in the sequel. The Portuguese race have been generally considered as differing but little from the Spanish; those, however, that have come within my view appear evidently inferior. It was not until near the close of the sixteenth century, that *coaches* were used in France; before which, it is said, the nobles rode to court, parliament, &c., on *mules* that were brought from the vicinity of the Alps and Pyrenees. They were usually black, of large size, well made, and mostly bred from fine *Spanish mares*. Savoy has long been noted for an excellent breed of mules. None very extraordinary are found in Italy, those used by the *Valterino*, are strong and of a respectable size, but of a slugglish and debased spirit. Very little can be said of those animals in Great Britain. The Catholic prelates brought over a number of superb mules, prior to the Reformation, but in the reign of *Elizabeth* so little was known of them, that a writer of that period says, "in Devonshire some were produced by a *Jack* brought from France, and were *knocked on the head* by the people, who viewed them as monsters."

A superior race of mules were bred in *Flanders*, from Jacks introduced by the Spanish monarchs while they held dominion in that country. Fifty of them were brought to England by the *Duke of Cumberland*, presented him by the *Empress Queen*, and from their beautiful appearance engaged the attention of a few individuals; but the spirit soon subsided. Notwithstanding those who bred and used them, were warm in praise of their utility.

Among a voluminous mass of treatises on agriculture and rural economy, published in that country for near a century past, scarce a line can be found devoted to the mule, except by *Dr. Anderson*, who, in his "Recreations in Agriculture," has made a few judicious remarks on the subject.

In Sir George Staunton's account of Lord Macartney's embassy to China, we are told that mules are valued in that economical empire, at a much higher price than horses. In our own country, prior to the war of the revolution, a few Jacks of an ordinary kind were imported—a small number of mules bred; and all exported to the West Idies. I have reference to New-England, as I am not aware that any attention was paid to the system in the Middle or Southern States, though it is not improbable that valuable mules may have been raised by the farmers and planters for their own use. When peace took place, the price of mules in the West Indies excited attention to the breeding of them, which was principally confined to Connecticut; and several cargoes of the small race of Jacks were imported from the Cape de Verd islands, and St. Michaels, one of the Azores. It should be observed that the exportation of Jacks from Spain, or any of her colonies, was strictly prohibited, and continued to be until after the Peninsular war. There might have been, however, a few smuggled from the Spanish part of Hispaniola into Cape Francois, and from thence introduced, but they were vastly inferior to the Spanish Jacks. From this miserable stock a system of breeding mules commenced, the best calculated to deteriorate any race of animals that has been or could be devised, since their creation. The purchaser of a *Jack*, when about to commence *mule dealer*, made little inquiry concerning him but of his capacity to *propagate* a mule. He placed him in a district where there was the greatest number of mares of qualities so *inferior*, that their *colts* would not compensate their owners for the expense of taking them to a *horse*, and contracted to purchase their mules at four months old. Those are kept in herds, with precarious shelter in winter, having ample opportunities afforded them to mature and transfer that propensity for *kicking*, which seems at first merely playful, into an habitual means of defence, to be exercised when the *biped* or any other race of animals approach them. In this *kicking seminary* they remain two years, and are then driven to market. At subsequent periods, a few Jacks of higher grades were procured, from which a small number of good sized mules were bred, and a few of them broke. The breed of Jacks have somewhat improved, and *mule dealers* are now located in most of the New-England States, and some parts of New-York. But the system as above detailed, with few exceptions, has continued; and it is from such a race of Jacks, and such a system of breeding and management, that the mules have been produced, with which the farmers and planters of *Maryland, Virginia*, and the *Southern States*, have been supplied from New-England; and such have furnished a criterion for a great portion of our countrymen to form an estimate of the value and properties of this degraded animal. It affords great pleasure to be enabled, for a short time at least, to pursue our investigations in a higher sphere.

Several of my friends who had viewed the Jacks and mules at Mount Vernon, in the life time of Gen. Washington, gave such glowing descriptions of them, and understanding that part of that stock was inherited by George W. P. Custis, Esq., I was induced to address a few queries to him on this subject; this gentleman, with his characteristic urbanity, very promptly furnished replies, with liberty to make such use of them as I pleased, and I cannot do better than to transcribe them from a letter received about three years since. Mr. Custis observes:

"The ROYAL GIFT and KNIGHT OF MALTA, were sent to General Washington about the year 1787;—the *Gift*, with a JENNET, a present from the King of Spain; and said to have been selected from the royal stud. The *Knight* I believe was from the Marquis de la Fayette, and shipped from Marseilles. The *Gift* was a huge and ill shaped Jack, near sixteen hands high, very large head, clumsy limbs, and to all appearance little calculated for active service; he was of a grey colour, probably not young when imported, and died at Mount Vernon but little valued for his mules, which were unwieldly and dull. The *Knight* was of a moderate size, clean limbed, great activity, the fire and ferocity of a tiger, a dark brown, nearly black colour, white belly and muzzle; could only be managed by one groom, and that always at considerable personal risk. He lived to a great age, and was so infirm towards the last as to require *lifting*. He died on my estate in New Kent, in the State of Virginia, about 1802 or 3. His mules were all active, spirited, and serviceable; and from *stout mares* attained considerable size.

"General Washington bred a favourite Jack called COMPOUND, from the cross of Spanish and Maltese. The *Knight* upon the imported Spanish *Jennet*. The Jack was a very superior animal; very long bodied, well set, with all the qualities of the *Knight*, and the weight of the Spanish. He was sire of some of the finest mules at Mount Vernon, and died from accident.—The General bred mules from his best coach mares, and found the value of the mule to bear a just proportion to the value of the dam. Four mules sold at the sale of his effects, for upwards of $800; and two more pairs at upwards of $400 each pair; one pair of these mules were nearly sixteen hands high. The only Jacks I know of at present, of the genuine Mount Vernon stock, are, one sold by me to Judge Johnson, of South Carolina, for five hundred dollars, at two years old; one given by me to William Fitzhugh, Esq., of Ravensworth, and one which I believe is possessed by my uncle, George Calvert, Esq., Riversdale.

"The Jack purchased by Judge Johnson, I have understood, has a very high reputation in the South.

"Upon loosing my groom, (Peter) who was the first and last groom to the Mount Vernon Jacks, I parted with my stock.

"There are many Jacks that have come into the country of late years, but of their value and properties I am unable to speak: though I rather presume that they are generally small, and only fitted to get mules for the cotton cultivation in the light lands of the South. Some very fine mules are raised about Hagerstown, Maryland, from Jacks

of the old breed; they are bred from stout wagon mares.

"As to my opinion of the value of mules, I shall always appear extravagant. I have scarce a horse on my estates for agricultural purposes, nor would I except of one as a gift, (except for road wagons,) of which I have no need, as my property lies upon navigable water. Nothing ever was so good as mules for the uses of this, our southern country; they live longer, eat less, and above all, are better suited to our slaves, than any other animal could possibly be; their strength, patient endurance of privation and hardships, slender pasturage exposure—and in short, all those ills to which animals are subject where slaves are their masters, give to mules a decided preference in all the agricultural states of the south.

"I do not know of any being trained to the purposes of pleasure carriages. They are often ridden, and go pleasantly, with great surety of foot. I have no doubt, but that in time they will generally be used for carriages, and would particularly suit mail coaches; they are very swift, and have great durability in travelling."

The *Knight of Malta*, mentioned by Mr. Custis, was unquestionably the first Maltese Jack ever brought to the United States. The second came in the frigate Constitution, on her return, I think, from her first cruise in the Mediterranean; and, I have understood, was sold in the District of Columbia, or one of the adjoining states. Since that time a number have been introduced by officers of the *navy* from *Malta*, and the large *Spanish breed* from *Minorca* and *Majorca*. From the Mount Vernon and those stocks, some fine mules have been bred in the middle states, and probably farther south. A few valuable *Maltese* Jacks have been imported in merchant ships.

The impressions received, when on a visit to the West Indies in my youth, by observing, on the sugar plantations, the severe labour performed by mules in *cane* mills, induced me, when I commenced farming, to purchase the first well broke mule I could light on; and notwithsanding he was so small as to require a vehicle and harness constructed purposely for him, his services were found so valuable, and the economy of using those animals so evident, that I was stimulated to great exertions for procuring several others of larger size; in this I succeeded, after great difficulty, to such an extent, as to have had more labour performed by them on *farm* and *road*, for thirty years past, than any person I presume, in New England; and every day's experience has served to fortify my conviction of the superior utility of the mule over the horse, for all the purposes for which I have proposed him as a candidate. And it should be considered, that those I have used were of an ordinary breed, vastly inferior to such as may be easily produced in our country, by attention to the introduction of a suitable race of *Jacks*, and a proper system of breeding and management. The question occurs how is this to be effected? I will premise, that there exists a strong analogy between three varieties of the horse, and those of the domestic ass, considered the most valuable. We have the *Arabian*, the *hunter*, and the stout *cart-horse*. There is the heavy *Spanish Jack*, with long slouching ears, which Mr. Custis has described, that answers to the cart-horse; another Spanish breed called the *Andalusian*, with ears shorter and erect, of tolerable size, plenty of bone, active, more spirited, and answering to the hunter. Then comes the *Arabian Jack*, with ears always erect, of a delicate form, fine limbs, and full of fire and spirit. Judicious crosses from these varieties, will be requisite to produce such kind of mules as may be wanted for general purposes. From the small Jack of *African* origin, with a *list* down his back and shoulders, are bred a small race of mules, by far the most hardy of any. With attention to selection in breeding the Jacks, with, perhaps, a *dash* of some cross of the foregoing description, a stock of mules may be produced, preferable to all others, for the light lands and cotton culture of the middle and southern states.

To procure any number of *Arabian* Jacks from their native country, is hardly practicable at the present time. *Egypt* has been celebrated by Sonnini and other travellers, for superb Jacks of the Arabian breed, which probably has been often improved by those introduced by the Pilgrims from Mecca. I apprehend no great difficulty in obtaining them from that country. There is, however, no question but the *Maltese* Jacks are of the *Arabian* race, more or less degenerated. The most of those brought to this country, that I have seen, were selected on account of their *size*, and had been used to the draught. I should recommend the selection of those that are esteemed most suitable for the *saddle*, as likely to possess greater *purity of blood*. A Jack of this kind was, a number of years since, imported from Gibraltar, that had been selected by a British officer at Malta; and very much resembled the *Knight of Malta* described by Mr. Custis. I found, upon a careful examination, that he differed but little from the description I had heard and read of the true *Arabian* race; indeed I could discover some prominent points and marks, those found by Professor Pallas, to belong to the *Hemionus*, or wild mule of Mongalia. From this Jack I have bred a stock out of a large *Spanish Jennet* of the *Andalusian* breed, that correspond very minutely with Mr. Custis's deseription of *Compound*, bred by General Washington, and also a *mule* that now, not three years old, stands fifteen hands, and has other points of great promise.

Such have been the ravages of war and anarchy in Spain for a long time past, that the fine race of *Jacks* that country once possessed have become almost extinct. In Majorca and probably, some part of the coast of Spain opposite, the large breed may be obtained: and there formerly was a superior race in *Andalusia*, which, it is hoped, have been preserved. Crosses on one of these breeds, by the *Arabian* or *Maltese*, I consider indispensable to furnish a race of Jacks for the production of the most desirable mules, uniting the weight and bone of one, with the spirit and vigor of the other; although their height will in a great measure depend on the mares, yet if sired by full blooded Maltese Jacks, their limbs are too slender and their pasterns too long for heavy draught; but for the *saddle*, especially from blood mares, they are admirable, and out of stout mares suitable for light carriages.

My attention has been but lately directed to breeding mules; and those intended only for my own use. The system adopted is to halter them at four months, and have the mules emasculated before six months old; which has great influence on their future conduct, and is attended with much less hazard and trouble than if delayed until they are one or two years old, as in the general practice. If they are treated *gently* and fed occasionally out of the hand, with *corn*, *potatoes*, &c., they soon become attached; and when they find that "every man's hand is not against them," will have no propensity to direct their heels against him, and soon forget they have the power. In winter they should be tied up in separate stalls, and often rubbed down. By such treatment there is not more danger of having a vicious mule than a vicious horse—and I am decidedly of opinion, that a high spirited mule, so managed and well broke, will not jeopardize the lives or limbs of men, women, or children by any means so much as a high spirited horse, however well he may have been trained.

The longevity of the mule has become so proverbial, that a purchaser seldom inquires his age. *Pliny* gives an account of one, from Grecian history, that was *eighty years old*; and, though past labor, followed others that were carrying materials to build the temple of *Minerva* at Athens, and seemed to wish to assist them; which so pleased the people, that they ordered he should have free *egress* to the grain market. Dr. Rees mentions *two* that were *seventy years old* in England. I saw myself in the West Indies, a mule perform his task in a *cane mill*, that his owner assured me was forty years old. I now own a *mare* mule, *twenty-five years old*, that I have had in constant work twenty-one years, and can discover no diminution in her powers; she has within a year past often taken upwards of a ton weight in a wagon to Boston, a distance of more than five miles. A gentleman in my neighborhood has owned a very large mule about fourteen years that cannot be less than twenty-eight years old. He informed me a few days since, that he could not perceive the least failure in him, and would not exchange him for any farm-horse in the country. And I am just informed, from a source entitled to perfect confidence, that a highly respectable gentleman and eminent agriculturist, near *Centreville*, on the Eastern shore of *Maryland*, owns a mule that is *thirty-five years old*, as capable of labor as at any former period.

The great Roman naturalist, in one of the most beautiful passages of his elaborate history of nature, observes that "*the earth is constantly teazed, more to furnish the luxuries of man than his necessities.*"* We can have no doubt but that the remark applied with great justice to the habits of the Romans in the time of Pliny; and I am much mistaken if ample proofs cannot be adduced that it will lose none of its force or *truth*, at this present period, in all northern climates, or any section of the United States, where the horse is employed for *agriculture* as well as for pleasure. Far be it from me, however, to disparage this noble animal, on the contrary, I feel a strong attachment for him; and at the same time a full conviction, that the substitution of the *mule* for the purposes before stated, as extensively as may be consistent with the requisite production of each species will have the effect of restoring the horse to the station from which he has been degraded, and place him, as in former ages, upon a more dignified footing—an object of *acknowledged* luxury; and thereby intro-

* "It is earth, that, like a kind mother, receives us at our birth, and sustains us when born. It is this alone of all the elements around us, that is never found an enemy to man. The body of waters deluge him with rains, oppress him with hail, and drown him with inundations; the air rushes on in storms, prepares the tempest, or lights up the volcano; but the earth, gentle and indulgent, ever subservient to the wants of man, spreads his walks with flowers, and his table with plenty, returns with interest every good committed to her care; and though she produces the poison, she still supplies the antidote; though CONSTANTLY TEAZED MORE TO FURNISH THE LUXURIES OF MAN THAN HIS NECESSITIES, yet, even to the last, she continues her kind indulgence, and when life is over, she piously hides his remains in her bosom."—[Pliny's Natural History, Book ii., Ch. 63.]

duce a more correct system of breeding and management, in which our countrymen are so generally deficient, consequently more perfect animals, and such an advance in the price of them, that will afford the farmer what he is now a stranger to: such remuneration as will make his *brood mares* a profitable species of stock. And it is obvious, that the system will be followed by an improvement in the breed of *mules*, in the same ratio as the miserable race of *scrub* mares, which are now consuming the profits of agriculture, shall become extinct.

It does not appear that the horse was employed by the *ancients* for any purpose of husbandry. The *ox* and *ass* drew the *plough* and the *wain*, and performed all kinds of drudgery until after the *feudal system* was established in Europe; when the numerous *retainers* of the *feudal lords*, who held their lands by the TENURE of performing *knight's service*, found themselves under the necessity of making the horses they were obliged to keep, contribute towards their support in the cultivation. From this time, I believe, we may date, and to this cause may be attributed the introduction of the *horse* for the purposes of agriculture. Since that period, the history of Europe is little else than the annals of *war* and its preparations; and no material for that *scourge*, except the deluded *human victims*, seems more necessary than the horse; accordingly we find, that throughout the whole country, from the *Rhine* or the *Seine*, to beyond the *Danube* and *Vistula*, which has been the principal *arena*, the system of agriculture has embraced, extensively, the breeding of horses of different grades and forms adapted to the several uses in war. Indeed whole provinces were appropriated almost exclusively to the rearing those animals for disposal to the different combatants; and it must be obvious that their general use in husbandry, at the same time, would follow as a necessary consequence. It cannot be expected, therefore, but that the *Dutch* and *Germans* who have emigrated to our country, should bring with them such strong predilections for the horse, which have continued with most of their descendants, especially in those sections where communities of that respectable and industrious portion of our population have been located.—In *Great Britain*, to the causes which have produced the effects described on the continent, may be added the insular position of the United Kingdoms, vulnerable from numberless and distant points, the horse has been considered, in connection with the unconquerable spirit of the nation, as one of the most efficient means of repelling invasion. A circumstance that would of itself be sufficient to account for the *overweening* attachment to this animal. But identified, as his services have been for a long period, with the convenience, sports, and recreations of all ranks and classes, and the science of *breeding* and *training*, forming a characteristic feature, it could not excite surprise, if the approach of that terrible spectre, *famine*, should produce little or no effect in the reduction of the number. And, although some of the most distinguished characters in the nation, eminent for their practical knowledge in rural economy, have been for half a century advocating the substitution of the ox for the purposes of agriculture, and demonstrating the feasibility, economy, and vast saving of food, yet it is said the number of laboring oxen have lately diminished, and horses increased. FIVE MILLIONS of the latter are now supposed to subsist in the United Kingdom, and two-thirds employed in husbandry—consuming, at a moderate estimate, the product of *twenty millions* of highly cultivated acres! And what is the consequence? *Consumption* follows so closely upon *supply*, that at every season of *harvest*, *let the preceding one be never so abundant*, fast sailing vessels are found in the various ports with their anchors *atrip*, to convey intelligence of the *result* to all parts of the world where a surplus of bread corn is grown—exciting such an interest in our own country, that the *farmer* on the shores of *Erie* and *Ontario*, and on the banks of the Ohio, may be seen reading *bulletins* of *British weather*—the *rain* and *sunshine* of every day in *August* and the *two* following months—often within thirty days after the time of their publication in London or Liverpool. Can it be supposed that in a country, where an attachment to the horse borders so nearly upon *infatuation*, that the question of the utility of the *mule* as a substitute, would be seriously agitated, or engage scarce a momentary investigation?

In no country is the mule better adapted to all the purposes of husbandry, for which the horse is used, than in every section of our own. And it would be highly desirable to be able to exhibit a calculation of the actual saving, *in dollars and cents*, by his employment; but, unfortunately, no correct data can be had. And as I consider such calculations, unless founded upon experimental facts, *and those multiplied*, to be as "tinkling cymbals," I shall merely submit a *desultory* between the *mule* and the *horse*, derived from such facts as my own experience, and information from authentic sources, will justify the assumption of.

From what has been stated respecting the longevity of the mule, I think it may be fairly assumed that he does not deteriorate more rapidly after *twenty* years of age than the horse after *ten*, allowing the same extent of work and similar treatment of each. The contrast in the mule's freedom from malady or disease, compared with the horse, is no less striking. Arthur Young, during his tour in Ireland, was informed that a gentleman had lost several fine mules by feeding them on wheat straw cut. And I have been informed that a *mule dealer* in the western part of New-York, attributed the loss of a number of young mules, in a severe winter, when his hay was exhausted, to feeding them exclusively on cut straw and Indian corn meal. In no other instance have I ever heard or known of a mule being attacked with any disorder or complaint except two or three cases of inflammation of the *intestines*, caused by gross neglect in permitting them to remain exposed to cold and wet, when in a high state of perspiration after severe labor, and drinking to excess of cold water. From his light frame and more cautious movements, the mule is less subject to casualties than the horse. Indeed it is not improbable, but a farmer may work the same team of mules above *twenty years*, and never be presented with a *farrier's* bill, or find it necessary to exercise the art himself.

Sir John Sinclair, in his "Reports on the Agriculture of Scotland," remarks, that "if the whole period of a horse's labor be fifteen years, the first six may be equal in value to that of the remaining nine; therefore a horse of ten years old, after working six years, may be worth half his original value." He estimates the annual decline of a horse to be equal to 50 per cent. on his price every six years, and supposes one out of twenty-five that are regularly employed in agriculture, to die every year: constituting a charge of four per cent. per annum for insurance against diseases and accidents. He considers five acres of land, of medium quality, necessary for the maintenance of each horse, and the annual expense, including harness, shoeing, farriery, insurance and decline in value, allowing him to cost $200, to exceed that sum about *five per cent.*, which is the only difference between the estimate of this illustrious and accurate agriculturist, and that of a respectable committee of the *Farmers' Society of Barnwell District*, South Carolina, who, in a report published in the Charleston Courier, of 23d of February last, state, that "the annual expense of keeping a horse is equal to his value!" The same committee also state, that "at four years old, a horse will seldom sell for more than the expense of rearing him." That "the superiority of the *mule* over the horse, had long been appreciated by some of their most judicious planters; that two mules could be raised at less expense than one horse; that a mule is fit for service at an earlier age, if of sufficient size—will perform as much labor, and if attended to when first put to work, his gait and habits may be formed to suit the taste of the owner." This report may be considered a most valuable document, emanating, as it does, from enlightened *practical* farmers and planters, in a section of our country where we may suppose a horse can be maintained *cheaper* than in *Maryland*, or any State farther north.

I am convinced that the small breed of mules will consume less in proportion to the labor they are capable of performing, than the large race, but I shall confine the comparison to the latter—those that stand from fourteen and a half to be rising of fifteen hands, and equal to any labor that a horse is usually put to. From repeated experiments, in the course of two winters, I found that *three mules* of this description, that were constantly at work, consumed about the same quantity of *hay* and only one fourth the *provender* that was given to *two* middling sized *coach horses*, moderately worked. And from many years attentive observation, I am led to believe that a *large sized* mule will not require more than from *three-fifths* to *two-thirds* the food, to keep him in good order, that will be necessary for a horse performing the same extent of labor. Although a mule will work and endure on such mean and hard fare, that a horse would soon give out upon, he has an equal relish for that which is good, and it is strict economy to indulge him, for no animal will pay better for *extra keep* by *extra work*. But if by hard fare, or hard work, he is reduced to a *skeleton*, two or three weeks rest and good keeping will put him in flesh and high condition for labor. I have witnessed several such examples with subjects twenty years old; so much cannot be said of a *horse* at half that age. The expense of shoeing a mule, the year round, does not amount to more than *one-third* that of a horse, his hoofs being harder, more horny, and so slow in their growth, the shoes require no removal, and hold on till worn out; and the wear from the lightness of the animal, is much less.

In answer to the charge generally prevalent against the mule, that he is "*vicious, stubborn* and *slow*," I can assert, that out of about twenty that have been employed on my estate at different periods during the course of *thirty years*, and those picked up chiefly on account of their *size* and *spirit*, wherever they could be found, *one* only had any vicious propensities, and those might have been subdued by proper management when young. I have always found them *truer pullers* and *quicker travellers*, with a load, than horses. Their vision and hear-

ing is much more accurate. I have used them in my *family carriage*, in a *gig*, and under the *saddle*, and have never known one to start or run from any object or noise; a fault in the horse that continually causes the maiming and death of numbers of human beings. The mule is more steady in his draught, and less likely to waste his strength, than the horse; hence more suitable to work with *oxen*; and as he walks faster, will habituate them to a quicker gait. But for none of the purposes of agriculture does his superiority appear more conspicuous than ploughing among crops; his feet being smaller, and follow each other so much more in a line, that he seldom treads down the ridges or crops. The facility of instructing him to obey *implicitly* the voice of his driver or the ploughman, is astonishing. The best ploughed tillage land I ever saw, I have had performed by two mules *tandem*, without lines or driver.

There is one plausible objection often urged against the mule, that "on *deep soils* and *deep roads*, his feet being so much smaller than those of the horse, sink farther in;" but it should be considered that he can extricate them with as much greater facility.

Few can be ignorant of the capacity of the mule to endure labor in a temperature of *heat* that would be destructive to the horse, who have any knowledge of the preference for him *merely on that account*, in the West Indies, and in the Southern States.

It is full time to bring our comparison to a close; which I shall do by assuming the position, that the *farmer* who substitutes *mules* for *horses*, will have this portion of his animal labor performed with the expense of *one spire of grass* instead of *two*; which may be equal, so far, to making "two spires grow where one grew before." For although a large sized mule will consume somewhat more than half the food necessary for a horse, as has been observed, yet if we take into the account the saving in expense of *shoeing*, *farriery*, and *insurance* against *diseases* and *accidents*, we may safely affirm that a clear saving of *one half* can be fully substantiated. But in addition to this, the *mule* farmer may calculate, with tolerable certainty, upon the continuation of his *capital* for *thirty years*; whereas the *horse* farmer, at the expiration of *fifteen years*, must look to his *crops*, to his *acres*, or a *Bank* for the renewal of his—or, perhaps, what is worse, he must commence *horse-jockey* at an early period.

The intense interest with which the public mind is at present occupied on the subject of canals now in operation and progress, encourages me to offer the *mule* as an important *auxiliary* in the enconomy of their management; as, I trust, it will not be denied, that on the *cheapness* of transportation, on them depends their *utility* as well as *profit* to the stockholders. The mule seems so peculiarly adapted for the labor on canals, that compared with the horse, he may be considered almost equal to a *locomotive power engine*. Among the advantages we have enumerated respecting his use in husbandry, the most of which are applicable to canal labor, that of the much greater security from *diseases* and *casualties*, which must necessarily require a great number of supernumerary *horses*, to prevent interruption in the line of passage, is not the least important; nor is the very trifling expense at which the mule can be supported during the winter months, as he will bear being taken off his *feed* till the boats are about to be launched in the spring, and in a few days can be made fit for efficient duty—while a *horse* will require at least *half* feed *if he does nothing*, or must be *fed high* for some time before he can resume the labor that will be demanded of him. The same advantage may be derived by his employment on *railways*.

In a communication, published in the *Utica Observer*, the 16th of May, inst., by Henry Seymour, Esq., one of the *canal commissioners* of New-York, it is stated that a *packet-boat* on the Erie Canal, requires a team of *three* horses to tow sixteen miles—going eighty miles in the twenty-four hours, including stoppages and detention of locks; the *relays* demanding fifteen horses for each *nautical* day. If it takes five days for a boat to be towed from Lake Erie to the Hudson, *seventy-five* horses will be required. I am not certain but it may be done in a little less time, but as there must always be supernumeraries kept, we shall be within bounds to estimate that number. In the same communication, the expense of each horse is estimated at *fifty cents* per day, I presume for subsistence *only*, without reference to *interest* or deterioration of *capital*, for the object of the estimate seems merely to show a *comparison* between the *packet boats* and *freight boats*, on a question of *profit and loss*; as it is remarked, that "many *contingent* expenses might be added to both." Taking this *data*, it will cost *thirty-five dollars* per day for the *horse* subsistence of a single packet boat. The *freight boats* require but *two*, and allowing for the time occupied in taking in and discharging their cargoes, with the other necessary detentions, averaging *forty miles* per day—which being double the time of the packet boats, although they may not require the same number of relays, the expense cannot materially differ. From these premises we may conclude, that for every boat navigating the *great Erie Canal*, there must be expended *three hundred and fifty dollars* for the subsistence of the *horses*, each time they tow her from the Lake to the Hudson and back. Now, if this can be done effectually by *mules* for one half this sum, and with an extension of *capital free of interest*, *fifteen years longer* than that vested in horses, the aggregate of this immense saving will appear by ascertaining the number of boats at the present time on the canal. But this is out of my power; and I should, perhaps, lead the reader *nearer the verge of incredulity*, were I to offer my own prediction what that number *will* be thirty years hence, the ordinary period of a mule's labor, and which will then be some years less than a single century since the PRIME MOVER and GUARDIAN of this *stupendous undertaking*, the present Governor of New-York, first saw the light of heaven.

I cannot resist an impulse to exhibit the *mule* in one other point of view. For the movement of *machinery*, the employment of this animal, when judiciously selected, has met with a most decided preference, in comparison with the horse, independent of the *economy* in using him. And if we consider the rapid, and probably progressive increase of *labor-saving* machines, in every department where they can be made subservient to the requirements of society, it is evident that there will be a corresponding demand for *animal* power, as well as for that *more potent*, derived from the element; and although the *latter* may *vastly* predominate, yet should the horse be employed, and his increase for other purposes continue, as it now does, in the *ratio* of population, the number, at no very distant period, may become as alarming in our own, as it is at ptesent in our *mother country*. And notwithstanding we may feel secure, from the extent of our territory and extreme diversity of *soil* and *climate*, but, above all, from being in possession of *Indidn corn*—the GOLDEN FLEECE found by our "*pilgrim fathers*," when they first landed on these shores; yet such peculiar advantages may not insure us against the visitations of one of the most distressing calamities that a feeling community can possibly be subjected to.

Brighton, Mass., May 27, 1825

CORN BREAD.

BY ELIZA.

If the editor of the Genesee Farmer will permit me to occupy a small space in his valuable journal, I will take the liberty to communicate one or two modes to make corn bread. They may be interesting to some of its fair readers, and peradventure assist them to give more variety to the cheer of the domestic board.

SNOW BREAD.

This is made by taking a quart of corn flour, and mixing intimately with it a table spoonful of lard. Then take two full quarts of snow and stir it well in the flour with a spoon; pack it close in the pan or oven in which it is to be baked, and submit it to a quick fire. If managed successfully, it will be found to be a far better article of its kind, than the famous *snow soap*, which attracted so much of the attention of our good housewives some years ago. It is exceedingly light and spongy, and will require nearly three quarters of an hour to bake.

CORN ROLLS.

Take a quart of meal, a spoonful of lard, and two spoonfuls of yeast; mix with warm water until the dough is quite soft. Set it in a warm place at night to rise, and bake it in a pan or in cakes in an oven for breakfast. Both this and the snow bread bake very well in a stove.

ELIZE.

Virginia, 3 mo. 1.

During the months of December and January last, the average number of persons who passed from Brussels to Malines, by the Railroad, was never under 800 every day. The total number of passengers in December was more than 28,000, in January more than 29,000; this will probably be surpassed in the present month.

From the Edinburgh Quarterly Journal of Agriculture.

EAST INDIA AND AMERICAN COTTON.

The growth of cotton might be much increased in India. There are ten distinct *species* of this plant known, of which there are many *varieties*. Of these species, two, the *Gossypium indicum* and *G. arboreum*, are natives of India. The cotton wool imported from India does not bear so high a character in the British market as the American. The American cotton plant is the *Gossypium herbaceum*; but the inferiority of Indian cotton wool, arises not so much from the difference of the species, as from the mode of managing and gathering the crop. In America the cotton wool is

gathered carefully by the hand from the Pods as it ripens, and placed in bags suspended from the necks of the gatherers. The locks of wool which fall on the ground, are gathered and kept separate from the rest. *The Indian cotton is gathered all at once,* whether it is thoroughly ripined or not; and it is thrown on the ground to dry and won. The mixture of the earth and brittle pods with the cotton, by this excessive carelessness, renders it dirty and unfit for the delicate machines of this country. The imports of this article into Britain will show the superiority which the Americans at present maintain over our Indian brethren. The quantity of American cotton spun in 1832, amounted to 212,313,696 lbs. whilst the East Indian of the same year only amounted to 18,287,280 lbs. The total import of cotton in 1832 was 270,690,000 lbs., of which 229,007,272 lbs. came from America.

SUGAR FROM INDIAN CORN.—M. Pallas lately presented to the Academie des Sciences of Paris a sample of this substance, extracted from the stem of the plant, which has been found to contain nearly 6 per cent. of sirop boiled to 40 degrees, a part of which will not crystalize before fructification; but it condenses and acquires more consistency from that period to the state of complete maturity. The most favorable time to obtain the greatest quantity of sugar, is immediately after the maturity and gathering of the fruit. The matter left after the extraction of the sugar, is capital to feed cattle or to make packing paper.—[London Mechanics' Magazine.]

RULE FOR DETERMINING THE WEIGHT OF HAY.—Hay in the field-rick, says Low, weighs somewhat better than 122 lbs. the cubic yard; after being compressed in the stack, it weighs from 140 to 180 lbs. and when old 200 lbs.

We have extracted the following notice of the manufacture of Beet Sugar, desiring to bring all the information on the subject before our readers.

We are under the impression that the *white beet,* or *scarcity,* contains more sugar and less coloring matter than the *red beet,* the *betterave* of France.

MANUFACTURE OF BEET-ROOT SUGAR.—We are indebted to Mr. Isnard for the following interesting communication, accompanied with a number of documents, which we regret that we have not room to notice at the present time, any farther than to say that they fully confirm the statements contained in the letter.

BOSTON, March 28, 1836.

To the Editor of the Daily Advertiser.

SIR,—If you should judge the present communication worthy of attention, it is at your disposal. In order to satisfy yourself concerning the authenticity of my statements I subjoin documents for your perusal, when at leisure.

The manufacture of Sugar of Beet has ceased to be an object of ridicule; the advantages that France draws from it are palpable and great, and the benefits which the manufacturers derive from it are now such that the French Minister of the Treasury has proposed to lay a tax upon it. France owes this new branch of industry to that great man whom she will honor through all time; for, had it not been for his sagacity and powerful assistance, it would have shared the fate of many other improvements lying for ages, or dying in their infancy, once pronounced by ordinary men visionary projects.

The discovery that beet contains a perfect sugar remained for over sixty years without any useful application; many attempts, however, had been made to derive the benefit of it; but those having made these attempts, being rather men of science than men of business, having operated only upon a small scale, with purely scientific views, and having made no calculations, either of expenditures or results, they had no ground to proceed upon. I undertook to solve that problem, and to that effect made, the first in France, an experiment on a large scale, and by a sufficient reward induced a chemist to assist me.

The result of this experiment was transmitted to Napoleon on the 19th March, 1811, and by his order rendered public; and though the birth of his son took place on the 21st of this same month, on the 25th following appeared the decree, a copy of which is among the subjoined documents. By this decree, as you will perceive, he created six experimental factories for the manufacturing of sugar; he appointed me the director of one of them, which factory he gave to me in property, as a reward for my labor, and for having (*perfectionne*) improved the process for obtaining the sugar of beet. Such was my zeal, that my factory in the fall of 1813 was prepared, and all the beet raised by me, or contracted for, so as to produce 1500 lbs. a day of brown sugar, and the same refined. The first entry of the allies into France caused the total ruin of my establishment. Up to 1816 political events were unfavorable for sugar making, but from that year this manufacture was resumed, and has since never ceased to increase and improve; it is now computed that over 300 such manufactories exist, producing together yearly about from 18 to 20 millions of pounds of brown sugar.

Now, sir, since the making of sugar of beet begins to attract the attention of some agriculturists of the country, I deem it of interest for them, and to gratify the curiosity of others, here to state what were the calculations made in France in 1832, (the latest date of my information,) and add a few observations respecting the benefits one may derive by the mere culture of beets in this country. It is generally admitted, viz:

That one ton, (2000 lbs.) of beet delivered at the factory, costs $3

That the expenses to work one ton of beet for obtaining its sugar, amount 4

—

That 2000 lbs. beets will yield 100 lbs. brown sugar, costing $7

Thus one pound of brown sugar, good quality, costs 7 cents.

By a comparison of the expenses of culture in various parts of France, and on various soils and situations, the average expenses of cultivating there the extent of an American acre of land, are as follows:—Rent and taxes, $5 00; ploughing and harrowing, $2 88: manure, $1 93; sowing, 50 cents; weeding and hoeing, $2 40; gathering, $1 60; carting, $2 56; farmer's profit, $4. Making a total of $21 47.

The produce varies according to the quality of the soil, the quantity of manure used, and the care bestowed on the culture—as we have taken the average of the expenses, so we must take the average of the produce, which is of 7 tons. Some lands yield as much as 15 tons.

The four dollars profit the French farmer derives from this culture, on every acre, is far from being the only one; the others are,

1st. The good state in which the field is left after gathering the beets—no further manure being wanted for the succeeding crop, which crop experience has proved to be always more abundant and of a better quality when succeeding the culture of beets, owing to the destruction of the noxious weeds removed by weeding the beets when young, and prevented from growing, by the thick foliage of the beet when strong.

2d. The facility afforded the cultivator to apply to the culture of beet lands, which he formerly let lie fallow, and consequently, without any additional expenses of rent and taxes, deriving as good a revenue from this land as from any other producing the most.

3d. The advantages the cultivator derives by the purchase from the manufacturer of the pumice of beet at a price not higher than beets, when experience has proved this pumice is worth for him fifty per cent. more; for in fact it is after all but beet deprived of two thirds of water, and consequently a more nourishing food for his cattle, perfectly fitted for fattening them, producing wonders in that respect, which could not be expected from beets in their natural state.

The following is a statement of the receipt and expenditure of a sugar establishment, as reported to the Society for the Encouragement of Manufactures in France. The whole work was performed in 91 days.

Purchase of 500 tons of beet, delivered at $3 20,	$1600	00
1638 days work of men, at 20s., 455 do. of women, at 12s., 364 do. of children, at 5s.,	400	40
For extra working during the night,	109	20
40 cubic feet wood for fuel daily, (28 cords 3-100 at $16 7-100 per cord,)	473	20
Sundry materials for manufacturing purposes,	813	60
Food for 18 oxen used in the mill,	163	60
Interest on $3000 at 15 per cent. for wear and tear,	450	00
Rent for buildings,	120	00
Total,	4130	00
Deduct for molasses sold for $320		
125 tons pumice at $3 20, 400		
Value of some materials left, 30	750	

Produce of 50,000 lbs. brown sugar at 6 7-10 cents,	$3380 00
Sale of 36,000 lbs. 1st quality, at 15 cents,	$5400
Sale of 14,000 2nd quality, at 10 cents,	1400 6800
Profit,	$3420 00

Should this notice be favorably received, I have at your disposal a few particulars respecting the cultivation of beets.

I am respectfully, sir,
your most obd't. serv't.,
MAX'N ISNARD.
French Vice Consul for Boston.

THE ROADS IN ENGLAND.—There is hardly any thing, perhaps, which at first gives more pleasure to an American traveller than the Roads in England. They have not near so many as we have, especially in some parts of New-England, where every man wants his own separate path to go in; but they are unspeakably better. Within the last few years, all the great roads throughout the kigdom have been thoroughly *McAdamized:* and they are, in more senses than one, 'Royal Highways.' They are very wide, almost perfectly hard, and as smooth as any graveled walk in the gentleman's pleasure grounds. Where there are hills, they are brought down, if possible, to a very small angle, or avoided, by turning a little to the right or to the left—our oldest brethren having found out, sometime ago, it would seem, that it is as far over an orange as around it. Men are kept constantly at work on these roads, breaking up stones for repairs, filling every little rut and depression as soon as it appears, picking up whatever may happen to lie upon the surface, and smoothing down the thin covering of earth which is spread over the solid basis. So perfect are these great thoroughfares, in winter and in summer, that you can calculate, with more certainty, at what time the Royal mail, from London, will reach the remotest towns in the island. A gentleman in Liverpool assures me, that there is scarce five minutes variation, in the time of its arrival there, (a distance of more than 200 miles,) from one end of the year to the other.—[President Humphry's Tour.]

Why do we not have such roads in this country? It is time; labor is not quite so cheap as in England, but the immense advantage to be obtained will, in many cases, warrant a considerable expenditure.

The useless multiplicity of our roads is certainly against us, as it is not possible to keep them all in tolerable repair, while a smaller number could be perfect.

Our roads, too, are laid out in such strange directions, particularly in the older settlements, as there the first path a man made was to his neighbor's house, and then to different parts of his farm, as his woods, springs, &c. These, in many instances, were the embryo of future highways.

It does seem, too, as if our ancestors went out of their way to go over a hill, at least no other rule can be discovered as having dictated the location of sundry roads, the remembrance of which is associated, in our minds at least, with ribs broken and shoulders dislocated.

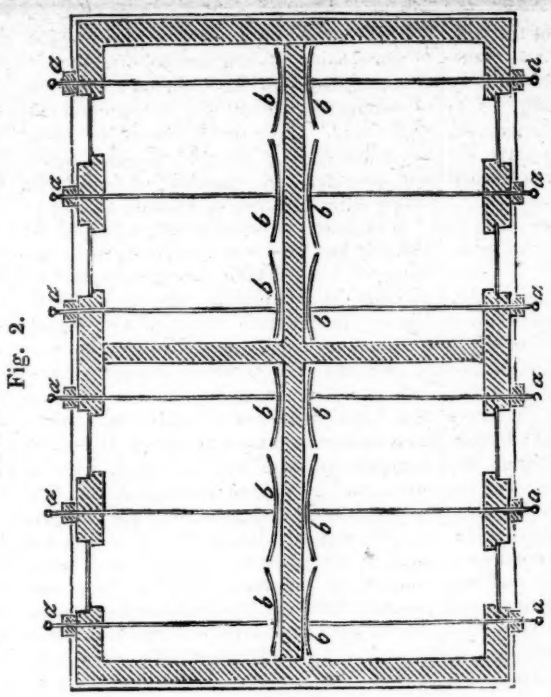


Fig. 2.

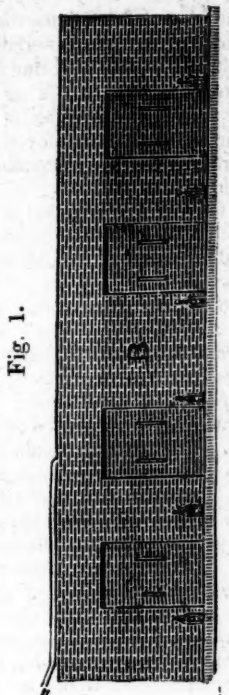


Fig. 1.

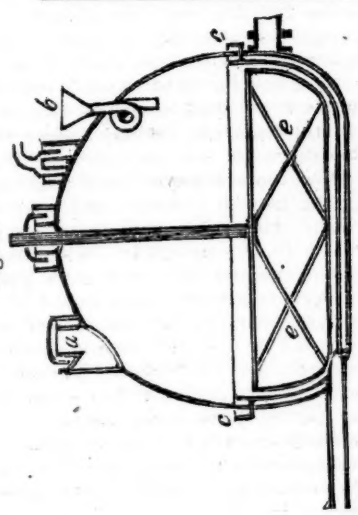
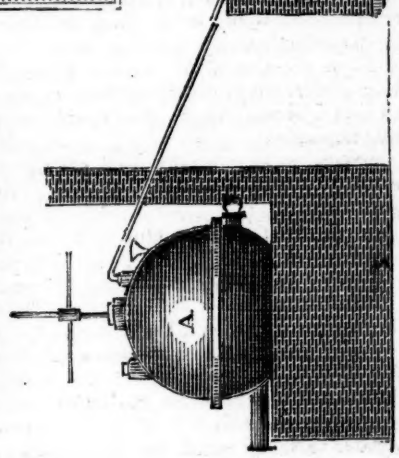


Fig. 3.



Applications of Chemistry to the Useful Arts, being the substance of a Course of Lectures delivered in Columbia College, New-York, by James Renwick, Professor of Natural Experimental Philosophy and Chemistry.

IV.

APPLICATIONS OF CHLORINE.

Chlorine may be applied in its gaseous form, as obtained in the mode practised in laboratories by action of manganese (*peroxide of manganese*) upon muriatic acid; or by the action of sulphuric acid on common salt and manganese; or as evolved from the chloride of lime. It may also be applied in solution, prepared by passing the gas through water, by steeping chloride of lime in water, or in the form of the liquor of Labaraque (*chloride of soda.*) The use of chloride of lime in both cases, and of chloride of soda in the second, have superseded the other methods. In consequence, before explaining the uses of chlorine it is proper that the manufacture of these two preparations should be understood.

MANUFACTURE OF CHLORIDE OF LIME.

AUTHORITY.—DUMAS. Chimic appliquee aux arts.

Chloride of lime in a dry form is manufactured in an apparatus invented by an English chemist, from whom the article is often called Tennant's bleaching powder. It consists of a retort or still of lead, connected by a pipe with a brick chamber cemented by a lute, which is not acted upon by chlorine. The still is heated by steam introduced into an envelope or *jacket* of cast iron. In the top of the still are two openings: one furnished with a stopper by which it is charged with manganese; to the other a bent tube is applied for the introduction of the acid, a part of which remaining in the tube serves as a valve to confine the gas. Within the still there is a reticulated vessel of cast iron, which is attached

to a rod passing through the top of the still. By means of this the materials are continually stirred in, order to bring new surfaces into contact. The still is so large as to receive a charge of 200 lbs. of manganese, and four are usually employed at once, for which reason the brick chamber is divided into four compartments.

The floor of the chamber is covered to the depth of three or four inches, with powdered lime, prepared by slaking. In some manufactories the hydrate of lime is disposed in wooden trays resting upon shelves within the chamber. Only half of these are filled at first. At the expiration of two days, the process is stopped, the chamber ventilated, and the remainder of the trays are introduced, being placed on the alternate shelves. The gas being again admitted, the process goes on for two days more, when the first set of trays are removed and replaced by others charged with fresh hydrate of lime. In this way the chamber always contains a portion of lime nearly saturated, and another portion nearly free of chlorine, and thus the decreasing rate at which hydrate of lime absorbs chlorine is compensated.

A still better mode, which is employed in a few instances, would be to keep the lime in a state of agitation. This has been objected to on account of the expense of the moving power, but in an establishment furnished with a steam engine, this would be of little importance.

The apparatus most generally used will be understood by reference to the annexed plate.

Fig. 1, elevation of the apparatus.
A, leaden still.
B, chamber in which the hydrate of lime is placed.
Fig. 2, section of still on a larger scale.
a, opening by which the manganese is introdoced.
b, funnel and bent tube for the introduction of the acid.
cc, water valve by which the head of the still is adapted.
ee, apparatus of cast iron for stirring the materials.
Fig. 3, plan of the chamber in which the hydrate of lime is placed.
aa, iron rods which move the scrapers *bb*.

In some manufactories on a small scale, the hydrate of lime is placed in conical vessels of stone ware, having a hole near the bottom, to which the pipe that conveys the gas from the retort is luted. At the end of the process, the vessel is inverted, and the lime falls out. That which is not charged with chlorine remains in powder, and is therefore readily separated from that which is converted into chloride, which is adhesive.

The direct mode of obtaining chlorine, is by the action of peroxide of manganese on muriatic acid. This may, and is often, followed in the manufacture on a large scale. The equivalents of the substances which are employed in the laboratory, are, 1 of peroxide of manganese to 4 of hydrochloric (muriatic) acid. The results are 2 of chlorine, 2 of water, and 1 of protochloride of manganese. The proportions are approached on the large scale by 6½ lbs. of pure oxide of magnanese, or a proportionate quantity of the common manganese of commerce, and 40 lbs. of common muriatic acid. The result should be about two cubic yards of the gas, weighing nearly ten pounds, and capable of saturating nearly fifteen pounds of hydrate of lime.

It is, however, obvious that a part of the chlorine has been lost by entering into combination with metallic manganese, and remaining in solution in water. A better process is therefore proposed by Dumas, by which an equal quantity of chlorine may be obtained at a far less expense of acid from a given quantity of common manganese. His formula is 10 or 12 lbs. of common manganese, equivalent to 6 1-2 of the peroxide, 4 lbs. of sulphuric acid, 4 lbs. of water, and 20 lbs. of muriatic acid. The retort being first charged with the manganese, the water is introduced, then the sulphuric, and finally the muriatic acid. The mixture of the water and sulphuric acid produce sufficient heat to cause the separation of the chlorine. No more fuel, therefore, need be used than is sufficient to keep up this temperature. In addition, the mixture is less likely to rise in viscid bubbles, and the chlorine is more free from water, as the attraction of the sulphuric acid will prevent that liquid from boiling until all the chlorine is disengaged. Sulphate of manganese will remain in solution instead of the chloride.

In some cases, however, the chloride of manganese may be of value, as it is used in dyeing. Here of course the existing process is to be preferred. When the manufacture of artificial soda is not a profitable object of industry, muriatic acid may be too expensive for the manufacture of chloride of lime. In this case, the materials whence that acid is obtainod (sulphuric acid and common salt,) may be used in its stead. The proportions in which they may be employed are, to 10 or 12 lbs. of common manganese, 12 of common salt, 20 of sulphuric acid, diluted with an equal quantity of water. The residuum of the retort is a solution of the sulphates of soda and of the protoxide of manganese.

A liquid mixture of lime and water (milk of lime) will condense 60 per cent. more chlorine than the dry hydrate. This preparation is not readily portable, but when the consumer manufactures it for himself, might be employed to great advantage. To make this liquid chloride, the milk of lime has been placed in a cylindric vessel of stone ware, lying horizontally, through the ends of which an axle is passed that carries a set of arms like those of a barrel-churn. The use of these is to agitate the mixture, and thus bring fresh surfaces of chlorine in contact with the chlorine.

From what has been stated above, it would appear that hydrate of lime is capable of condensing about two thirds of its weight of chlorine. In the ordinary manufacture, this strength is rarely reached, and the article may also be injured by exposure. It is therefore important that some mode should be pointed out by which the actual quantity of chlorine condensed by the lime should be ascertained. No ready method fitted for the use of practical men has yet been proposed, by which this object can be effected with certainty. The method in common use is rather relative than absolute, and consists in inquiring into the quantity of the solution of indigo in sulphuric acid, the solution of a given quantity of chloride of lime is capable of discoloring. This method will give different results, both from the different qualities of indigo and different modes of manipulation. But by using the same solution of indigo, and operating in exactly the same manner, the comparative value in reference to a standard parcel of chlorine of lime is capable of being ascertained with tolerable accuracy.

PREPARATION OF THE SOLUTION OF CHLORIDE OF SODA OR LIQUOR OF LABARAQUE.

The works on elementary chemistry give the mode proposed by Labaraque himself, for forming this liquor, by passing chlorine in its gaseous form through a solution of sub-carbonate of soda. It is therefore unnecessary to repeat it here. It may, however, be stated that the value of the liquor is not increased by saturating the water with chlorine, but that it is in its best state when the chlorine is condensed in the largest quantity which can exist without causing the escape of the carbonic acid; and it is usually inferred that the chlorine, decomposing a part of the sub-carbonate, causes its acid to unite with the remaining soda to form the neutral carbonate of soda. If the quantity of chlorine exceed this proportion, which is of course just half of what might be condensed, muriatic acid will form in the solution, and chloride of sodium will be the final result.

The most convenient process for the preparation of chloride of soda on the large scale, is that invented by Payen, in which the chloride of lime is decomposed by sub-carbonate of soda. The proportions in his formula are: 100 parts chloride of lime, 188 of crystalized sub-carbonate of soda, and 1800 of water. The chloride of lime being dissolved, and the solid residuum washed, the sub-carbonate of soda dissolved in boiling water is added; the liquor is filtered, and to the clear liquor 62 parts of crystalized sub-carbonate of soda is added.

1. DISINFECTING.

Rationale.—Chlorine owes its powers of destroying the offensive effluvia of putrescent animal and vegetable substances, and of rendering innocuous the matters which convey the contagion of infectious diseases, to its powerful affinity for hydrogen. The gases which arise from putrescent animal matter are principally ammonia (a hydroguret of nitrogen) and carburets of hydrogen; and although they are not the substances which affect our nerves most offensively, they are certainly the vehicles which convey those which do so to our organs of smell. The effluvia of decaying vegetables are principally composed of carburetted hydrogen, and although our senses cannot detect any other substance, yet there can be no question that the gas so produced does convey a matter injurious to the human constitution, for while the *gas*

manufactured for illumination may be breathed, even in quantities sufficient to render the air highly offensive, without injury, the same gas evolved from marshes and stagnant waters is always unwholsome. The diseased animal matter which composes the virus of cutaneous diseases, such as small pox, and collects in the sores of the plague, is also composed partly of hydrogen, and therefore capable of decomposition by chlorine. These peccant substances being capable of forming vapor, may thus be conveyed through the air, but in this state also, chlorine will act upon them.

Chlorine is destructive of animal life, and even when largely diluted immediately kills small animals. Even then, if, as some have supposed, the malaria which causes yellow fever and other analogous diseases of less malignancy, is owing to the presence of animalculæ, chlorine may be applied to destroy them.

Application.—Chlorine may be applied in its gaseous form to the disinfection of the air. The gas may be prepared as it is needed, by the action of peroxide of manganese (common manganese of the shops) on muriatic acid. This action, however, need not be aided by heat, as when the gas is prepared for chemical experiments, inasmuch as the object is to produce a constant and steady current, instead of a sudden and copious supply. A bottle, furnished with a glass plate ground to lie upon its neck, is well suited for this purpose, and may be made of various sizes, according to circumstances, there being a form so small and so conveniently arranged, that it may be carried in the pocket.

Chloride of lime may be decomposed, by the action of water. In order to obtain the gas, a portion of chloride of lime is put into a shallow basin and covered with water. As the evolution of the gas becomes feeble it may be rendered more rapid by adding a small quantity of acid. Sulphuric acid very much diluted may be employed, but it is better, particularly when it is used in families, to add common vinegar.

In disinfecting chambers and buildings, the doors and windows are to be closed, and the fumigation continued until the peculiar smell of chlorine can be perceived in every part, and remains permanently when its source is removed. In a sick room it will be expedient to continue the fumigation as long as the sick person remains in it, and for some hours after. All moist offensive matters should be sprinkled with the dry chloride, and dry matters covered with its solution.

A solution of chlorine may be prepared by steeping chloride of lime in water in the proportion of eight ounces to each gallon of water, and decanting it from the lime. This may be used for steeping the bedding and clothes of persons affected with contagious diseases, or to wet cloths in which putrescent matters may be wrapped; but the chloride of soda is a much more convenient and cleanly preparation. By the aid of it, human bodies far gone in putrefaction have been disinterred for examination; and by one or the other preparation, the disagreeable and often dangerous effects of animal and vegetable decomposition may be in a great measure prevented.

In cases where it may be necessary to touch persons affected with contagious diseases, the hands should be washed with one of the solutions, and this will be efficacious even after many minutes, unless the virulent matter have been introduced through a wound. By the use of these substances several diseases that have hitherto been scourges of the human race, have already been diminished in extent, and might, if all were prudent enough to employ them, be extinguished altogether.

To show their important value, a French physician in the Levant (Parisot) was able to inspire five other persons with confidence in the efficiency of chlorine; these were of various ages and different constitutions. Six suits in which persons had died of the plague were purchased, steeped in solution of chloride of soda, and dried. Each person being furnished with a suit, wore it for several days. No one of the six took the disease, while, had there been no precaution, all former experience would have made it nearly certain that more than two thirds of them must have been infected, and a considerable proportion of these would have died.

In our own naval service, the only vessel in which yellow fever has occurred in the Gulf of Mexico, since fumigations with chlorine have been practised, was one where they were not employed; and in one of the Spanish expeditions against Mexico, several vessels loaded with soldiers and sailors, were exposed for months to the pestilential air of the Terras Callientes without a single case of fever occurring.

In fine, we cannot avoid expressing our conviction that it is impossible, that any disease truly contagious can be propagated in air so charged with chlorine that its peculiar smell is sensible, nor any malady arising from the presence of unwholsome vegetable and animal matter. It will of course be impossible to disinfect extensive districts by artificial means, but so long as a disorder is confined to a limited space, its further extension may be checked, and even a building in an infected district may be rendered safe to its inhabitants, provided they do not quit its walls, by the aid of chlorine.

Experiments seem to be wanting, whence we might judge whether chlorine is as efficient in checking the extension of cholera, as it certainly is in preventing the spreading of other diseases; the impression of medical men, however, is that it is not.

2. BLEACHING.

History.—The ancient progress of bleaching vegetable matters is the same as that employed for domestic purposes, with the addition of an agent to neutralize alkaline matter which might otherwise injure the vegetable fibre. The articles were repeatedly washed with alkaline leys, or with soap; they were then steeped in a weak acid; and, after being well rinsed in pure water, were spread out on meadows in order to be exposed to the sun and air. In this position they were frequently sprinkled with water. The only water which is adapted to this purpose is that which in ordinary language is called soft. This is found in streams only at a distance from their source, and from a command of water of this description, as well as from the extent of its meadow lands, Holland for a long time monopolized the bleaching of the greater part of Europe. The linens of Ireland and Great Britain were sent thither to be bleached, and, as the process was a long one, it was seldom that the capital employed in the manufacture was turned more than once a year. The successive washing, and exposures to the air requiring to be repeated fourteen or fifteen times, and the latter being only practicable in fine weather. The acid used to neutralize the alkaline matter was sour milk, in which by fermentation acetic acid had been generated.

The first improvement in the process was the substitution of dilute sulphuric acid for the sour milk. Still, there was no great saving in time, until Berthollet in France proposed the application of the bleaching properties of chlorine. This substance was at first applied in its gaseous form to the articles, suspended while wet with water in close chambers. Its solution in water was next introduced. This has the defects of being difficult of carriage, and of becoming charged with muriatic acid by the decomposition of the water. In order to neutralize the acid as it forms, the water, was charged with a carbonated alkali or with magnesian earth. In the use of the former it was discovered that a chloride of the alkali was formed which would be decomposed by the coloring matter of the vegetable substance, and that in this liquid chloride, more of the chlorine was retained than in the same bulk of pure water.

This liquid chloride of Potassa has been much used under the name of liquor of Javelle.

The use of magnesia led to the discovery of the dry chloride of that earth, and it being found that a similar compound was formed with lime, the latter in consequence of its inferior cost finally supersceded the former. By the use of chlorine in either mode, the process which formerly occupied several months, is now completed in a day or two.

Rationale.—Hemp, Flax, and Cotton, which are the only substances of vegetable origin that are much employed in the manufacture of cloths, are more or less colored with a brown or yellowish substance. This coloring matter is partly oleaginous, and partly resinous. The oleaginous matter is rendered soluble in water by an alkali; but as any excess of this would attack the vegetable fibre, it must be neutralized by an acid. The resinous part of the coloring matter, if moist, decomposes slowly on exposure to the sun and air; hence the ancient mode of bleaching. This resinous matter when no longer protected by the oil is rapidly decomposed by chlorine; hence the modern method.

(A) BLEACHING OF COTTON YARN BY CHLORINE.

AUTHORITY—VITALIS, Cours de Teinture.

First operation.—Alkaline Bath.—A quantity of good pearlash in powder is mixed with half its weight of recently slacked lime. To this is added water in the proportion of thirty times the weight of the

potash. The mixture is occasionally stirred, and at the end of twenty-four hours is allowed to settle. The clear liquor is then decanted. The yarn to be bleached is thrown loosely into a copper boiler, and the alkaline solution poured upon it, until the upper part of the cotton is two or three inches beneath the surface of the liquid. The boiler is then slowly heated until the liquor boils, and the ebullition is kept up for four hours. At the end of this time the cotton is removed, and after being permitted to drain, is well rinsed in running water, after which the liquid is wrung out, and the yarn hung up to dry; in fine weather in the open air, and in bad weather under sheds.

Second operation.—Bath of Chlorine.—This bath is formed by steeping chloride of lime in water, in the proportion of eight ounces to each gallon; the insoluble matter is allowed to settle, and the liquor decanted. The yarn is placed in regular layers in a wooden vat, the hanks in the successive layers crossing each other. On these the clear solution of chloride of lime is poured until they are completely immersed, and the liquor rises above them three or four inches. The yarn having been steeped for a couple of hours, the liquid is drawn off by a spigot in the bottom of the vat, and is replaced by pure water, which being drawn off in its turn, carries with it the chloride which may have adhered to the yarn. The yarn is then rinsed in running water, wrung and hung out to dry.

Third operation.—Acid Bath.—Sulphuric acid is diluted with sixty times its weight of water, and the yarn is steeped in it for a time not exceeding a single hour for the coarsest numbers and less for the finer yarn. On taking it from this bath. it must be repeatedly washed with great care in running water.

Fourth operation.—Soap Bath.—The yarn is washed with white soap in water for the purposes of neutralizing any sulphuric acid which may remain, of removing the last portions of chlorine, and of rendering the cotton soft and flexible. It is then rinsed, wrung, and dried.

In order to brighten the color, cotton is sometimes steeped after the four preceding operations in water, through which a small quantity of cobalt blue has been disseminated.

These operations are sufficient for the inferior qualities of cotton yarn. The finer kinds are immersed in an alkaline bath of greater strength; are twice passed through a bath of chloride of lime, that used the second time being weaker than the first; and cobalt blue is always employed to finish them.

Linen and hemp threads are bleached in the same manner as cotton yarn, but they must be prepared for the alkaline bath by steeping them for two or three days in water, by which the coloring matter is softened and made more accessible to the chemical agents. The methods for bleaching woven cloths of the three several materials are more difficult than are necessary for yarn, but do not differ in principle. It is only necessary, according to the firmness of the cloth, to repeat the processes in regular succession two or three times.

It may be remarked that bleaching by chlorine, if carefully performed, is, contrary to general prejudice, less likely to injure the texture of the material than grass bleaching. The latter, too, may be said to be wholly abandoned, so that the inscription upon foreign goods of "genuine grass bleach," is untrue, and were it true, would be no warrant of superiority in quality.

Chlorine does not act upon the native coloring matters of wool or silk, but as the modes for discharging them go under the same name, we may with propriety consider them in this place.

(B) BLEACHING OF SILK.

AUTHORITY.—VITALIS. Art de Teinture.

Silk is covered with a substance which has the character of a gum, and is usually of a color more or less inclining to yellow, although the finer raw silks of China are said to be perfectly white. Even in the latter case, the process which is used to discharge the color, is in some degree necessary to prepare the silk for receiving dyes.

Silk may be bleached either by the aid of sulphurous acid or without it.

To bleach it without the use of sulphurous acid, a bath is prepared by dissolving white soap in water, in the proportion of 30 parts to 100 of silk. The solution is raised to the boiling temperature, but not permitted to undergo the act of ebullition. The silk is steeped in this bath until the harshness given by the gum disappears, and is then wrung out and dried. It is next put into sacks made of coarse canvass, each of which holds about thirty pounds of silk. These sacks are put into a boiler with a weaker solution of white soap, which is boiled for an hour and a half. The silk is then taken out, rinsed in running water, and dried. The dry silk is finally steeped in a bath of hot but not boiling water, in which white soap in the proportion of a pound to 30 gallons of water has been dissolved. To this is added a small quantity of some coloring matter, which is anatto when the hue of Chinese silk is to be imitated, and cobalt blue in other cases.

This method is less perfect than that which brings in the aid of sulphurous acid, as a substitute for the last of the three baths above described. The silk, after being rinsed from the second bath of soap is suspended upon poles about 8 feet above the floor of a chamber, which has no chimney, and is provided with doors and window-shutters that can be opened and closed without entering the chamber. For every hundred pounds of silk a pound and a half of roll-brimstone is put into an earthen dish on the floor of the chamber, and set on fire. The doors and windows are then tightly closed. The sulphurous acid which is first generated by the combustion of the sulphur is condensed by the water adhering to the silk, and after this is saturated, fills the chamber. The silk is left in this atmosphere of sulphurous acid for twenty four hours, after which the doors and windows are opened and the chamber ventillated. In summer the current of air which replaces the sulphurous acid is sufficient to dry the silk. In winter portable furnaces containing charcoal in small fragments are introducee into the chamber, and after they are set on fire the doors and windows are closed. In both cases, the combustion, whether of sulphur or charcoal is slow, as the necessary oxygen must make its way through the accidental crevices of the doors and windows.

In neither of the ways above described is the discoloration of the silk permanent. On exposure to the air in wear, the natural color of the silk is partially restored. It therefore becomes necessary to bleach white silks that are in wear, from time to time. This is done by suspending them, while wet, in a barrel, in the bottom of which a small quantity of sulphur is inflamed in an earthen vessel. The top of the barrel is then covered by a cloth, and the whole is left undisturbed for several hours.

BLEACHING OF WOOL.

Wool is coated with a greasy substance called the *Yelk*, with which a yellow coloring matter is combined. The coarser wools contain least of this substance, but in the finer merinoes it amounts to two thirds of the whole weight. The removal of this cannot be wholly effected by chemical means, but must be partially effected by the mechanical operation called fulling. This may be performed upon the wool, on yarn, or on the woven cloth. It consist in beating the article in a mill, with water and a mineral called Fuller's Earth, which is a silicate of alumina in which the silex is in greater proportion than in ordinary clays.

After having been fulled, the wool is washed in luke warm water, in which a small quantity of a soap is dissolved, until the residue of the yelk is removed. After being allowed to drain, it is rinsed in running water, permitted again to drain, and dried in the air.

This method is not successful unless the water is perfectly free from saline matter, or in ordinary language soft. In districts where large supplies of soft water cannot be obtained, it is considered necessary to mix the water used in cleansing wool with one fourth of its bulk of putrid urine. This supplies an ammoniacal salt, (phosphate of ammonia and soda,) by which the sulphate of lime, which gives to water the character know by the epithet *hard* is decomposed. In countries where the woolen manufacture is carried on extensively, this disgusting substance is in consequence a profitable article of commerce. There are however modes of rendering water soft, which we shall have occasion to describe hereafter, which might be advantagously introduced in the woolen manufacture.

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